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PROFESSIONAL SURVIVAL— ITS DEPENDENCE ON HOSPITAL PHARMACY

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Mildred Montag, Professor of Nursing Education, Teachers College, Columbia University, New York, N. Y.
Albert L. Picchioni, College of Pharmacy, University of Arizona, Tucson, Ariz.
Joy B. Plein, *Assistant to the Chairman*, Lecturer, Seattle Pacific College, Seattle, Wash.
G. Victor Rossi, Philadelphia College of Pharmacy and Science, Philadelphia, Pa.
Edward Superstine, Director of Pharmacies, Rothschild-Haddassah Hospital, Jerusalem, Israel
Vernon O. Trygstad, V. A., Rm. 821, Washington 25, D. C.
Charles O. Wilson, Dean, School of Pharmacy, Oregon State College, Corvallis, Oreg.

Special Appointments

ASHP Delegate to APhA House of Delegates:

Vernon O. Trygstad, V. A., Rm. 821, Washington 25, D. C. (1963). Alternate - Clifton J. Latiolais, Ohio State University Health Center, Columbus, Ohio (1962)

ASHP Representative to the Council of the American Institute of the History of Pharmacy:

Jack S. Heard, St. Francis Memorial Hospital, San Francisco, Calif.

ASHP Representative to the Pharmacy Section Committee and Council, American Association for the Advancement of Science:

Joseph A. Oddis, 2215 Constitution Ave., N. W., Washington 7, D. C. Committeeman-at-Large: Don E. Francke, University Hospital, Ann Arbor, Michigan (1960, 1961, 1962)

ASHP Representative to the National Advisory Commission on Careers in Pharmacy:

Vernon O. Trygstad, V. A., Rm. 821, Washington 25, D. C.

ASHP Representative to APhA's Pharmacy Advisory Commission on Poliomyelitis Control:

Joseph A. Oddis, 2215 Constitution Avenue, N. W., Washington 7, D. C.

Joint Committee of American Hospital Association and the American Society of Hospital Pharmacists

. . . . . .

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USPHS, Division of Hospitals
Third & C Sts., S.W.
Washington 25, D. C. (1963)

GROVER C. BOWLES
Baptist Memorial Hospital
Memphis, Tenn. (1963)

PAUL F. PARKER
University of Kentucky
Medical Center
Lexington, Kentucky (1962)

VERNON O. TRYGSTAD
V. A., Rm. 821
Washington 25, D. C. (1962)

AHA Representatives

HERBERT A. ANDERSON
Lincoln General Hospital
Lincoln 2, Nebr. (1961)

H. ROBERT CATHCART
Pennsylvania Hospital
Philadelphia 7, Pa. (1962)

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If these patients had periodically tested their urine after the first finding of glycosuria, many of them might have detected recurrence of glycosuria—thus permitting earlier diagnosis of diabetes by the physician and possible avoidance of degenerative complications. Slight glycosuria, even when only occasional, should always arouse suspicion of latent diabetes.

*Pomeranze, J.: J. New York M. Coll. *1*:32, 1959.

Periodic urine-sugar testing at home is an integral part of the follow-up of "benign" glycosuria. Its practicality is increased when the patient charts his findings on the CLINITEST® Graphic Analysis Record. This chart frees the physician from dependence on the patient's memory and enables him to follow at a glance the trend and degree of any glycosuria.

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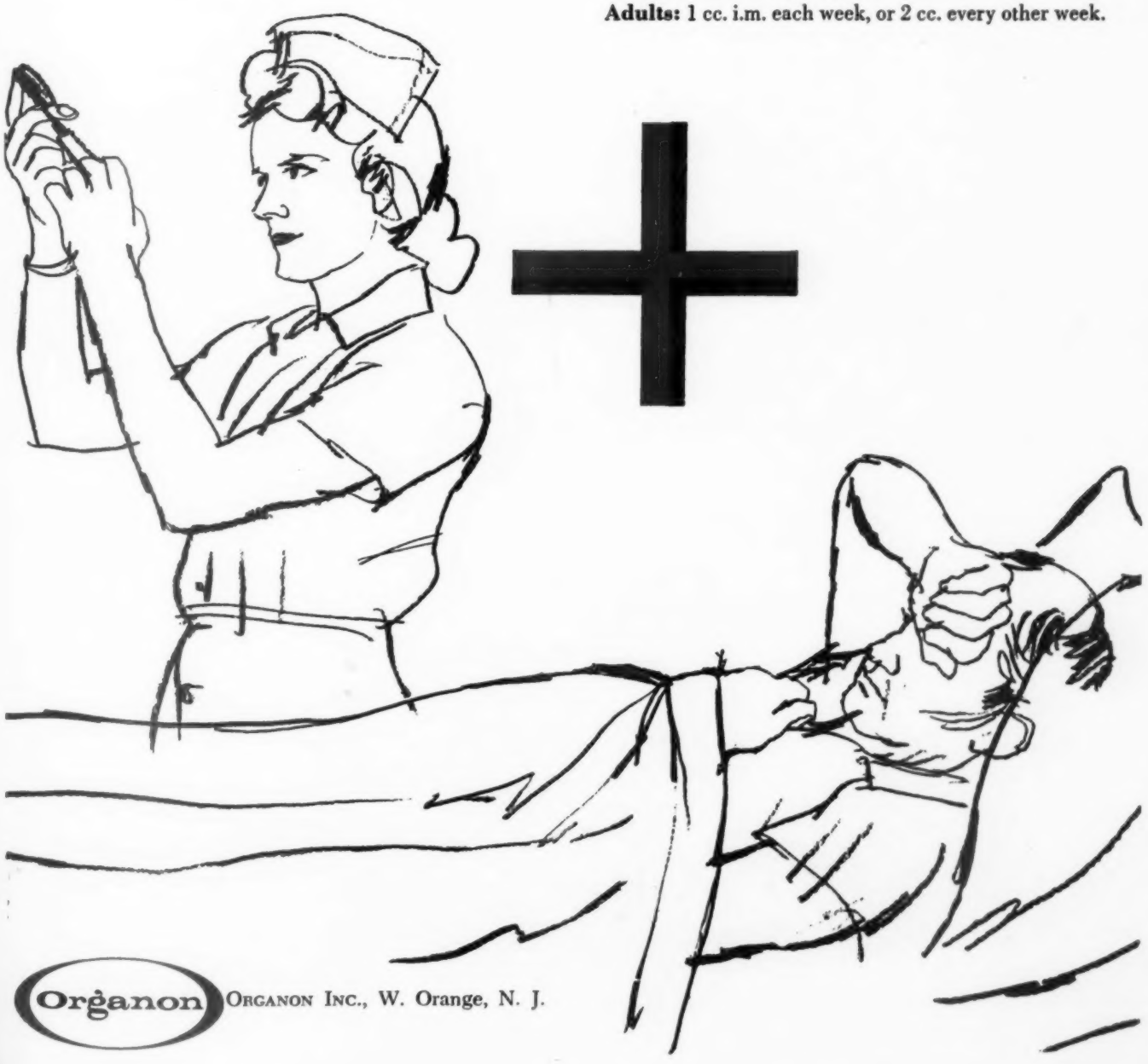
Supplied: 1-cc. ampuls (box of three) and 5-cc. vials, 25 mg. nandrolone phenpropionate/cc.

Adults: 1 cc. i.m. each week, or 2 cc. every other week.



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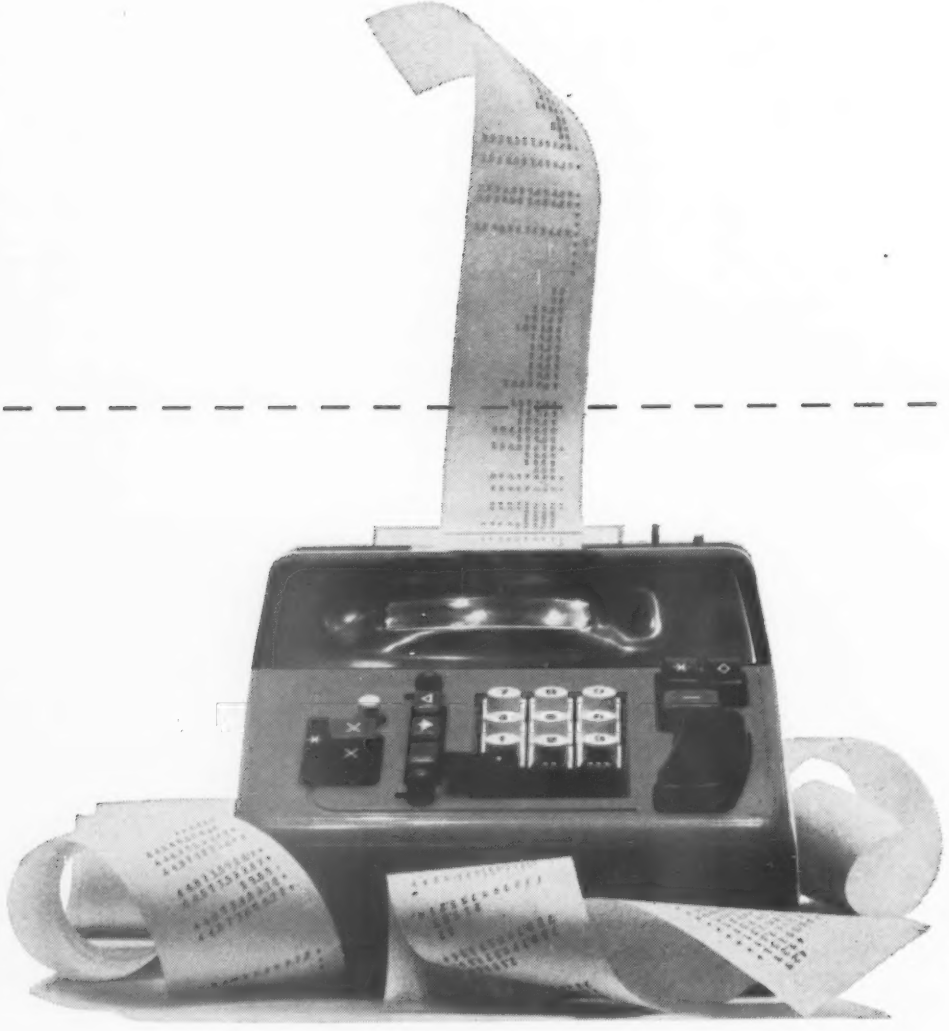
Hospital costs rise and rise



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Hospitals help defeat the inflationary spiral by reducing costs of labor and equipment demanded by older, more time-consuming injection systems.
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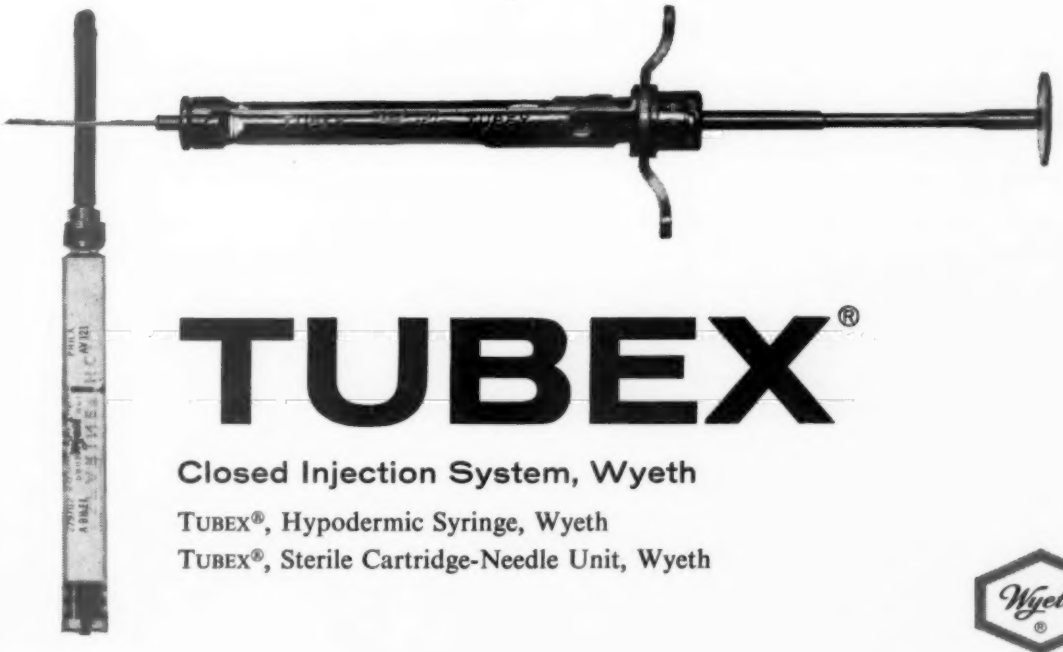

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Hospital Pharmacy Notes

No. 2 May/June/1961

by Dr. Glen J. Sperandio

Dr. Sperandio is associate professor of pharmacy at Purdue University, West Lafayette, Indiana, where he teaches dispensing and hospital pharmacy and also directs graduate research in the areas of clinical pharmacy and product formulation. He has had experience in the pharmaceutical industry and retail pharmacy as well as in hospitals, and, as editor of this column, he will discuss items of interest to the hospital pharmacist. Dr. Sperandio and Eli Lilly and Company invite your comments, suggestions, and contributions.

THE PHARMACIST'S WORLD

There was a time when the world of the hospital pharmacist was relatively small; he stayed close to his pharmacy in the hospital, and most of his problems were confined to his own department. He was, in a sense, sheltered from the outside world.

Today, the hospital pharmacist is living in a different world—but he is sometimes slow to realize it. His world today is one of change, and he must keep abreast of the changes. To do this, he must expand his interests and contacts, and he must think beyond the four walls of his pharmacy. The hospital pharmacist must be concerned with national and international as well as with local changes, because a world of change is a world of challenge, and challenges are met best when one understands them.

Keeping up to date is a continuous challenge to every hospital pharmacist. This subject was ably discussed in a recent editorial in the *Pharmacist*, a journal written and published by the students of the Purdue University School of Pharmacy. The editorial was written by Bonnie Hanf, a senior pharmacy student who plans to do graduate work in hospital pharmacy. Here is what this young pharmacist thinks:

"What if one of your customers asks you a question regarding the Forand Bill? Can you discuss the question of socialized medicine intelligently? Do you know how the profession of pharmacy was affected by the outcome of the presidential election? Do you know what legislation is pending regarding medicine and old-age health-care programs? Do you realize the true significance of the Kefauver investigations? If your answer is 'No,' then you are not a competent pharmacist.

"What about the future problems which will face the profession—generic versus trade-name prescribing, the hospital formulary system, and the . . . recognition of pharmacy as a profession? If you have not been gathering background information and comparing the arguments advanced by both factions of the debate . . . then you are not a competent pharmacist.

"In this world of constant crisis, every citizen needs to be well informed regarding world situations and political problems. In the world of pharmacy . . . every pharmacist needs to be well informed on every phase of this important work of ours. Not only must you know the latest drugs which have been placed on the market . . . but you must also know and understand the problems which face the profession of pharmacy today.

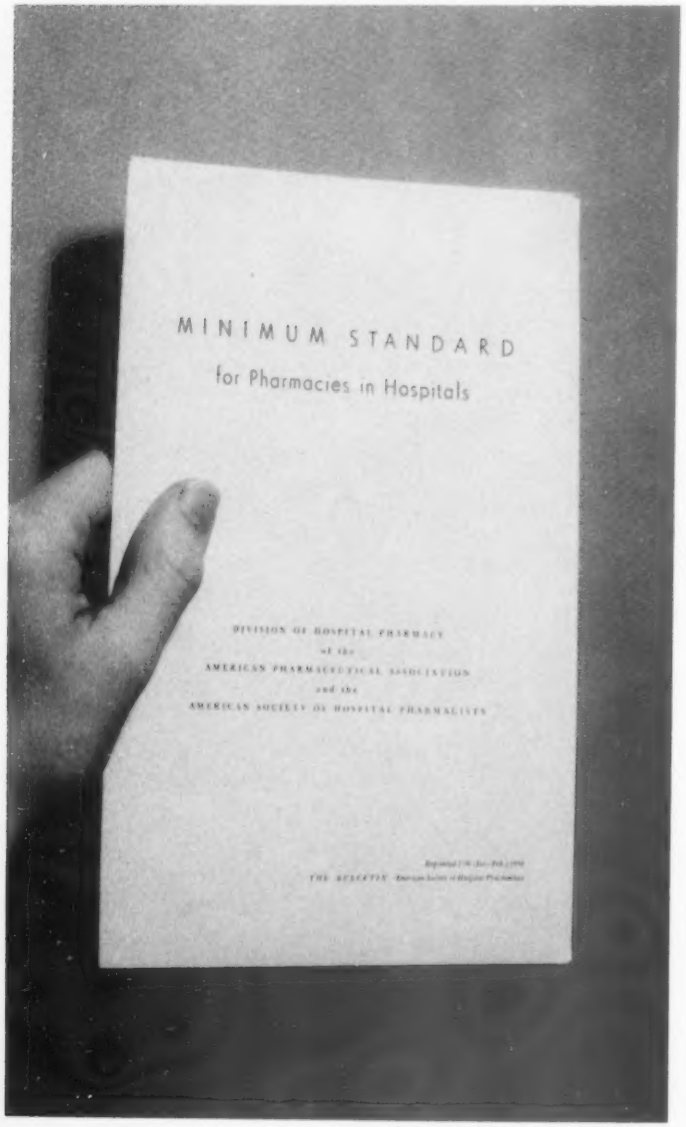
"Lack of communication between the pharmacist and the public is recognized as a major problem facing us today, but how can we expect the public to be informed when we are not? How can we expect the public to know and understand the pitfalls which block the continuing advance of pharmacy if the pharmacist himself is not aware of the pending problems?"

The pharmacist's world is a world full of problems. Are *YOU* preparing yourself for them?

This insert is published as a service of Eli Lilly and Company, Indianapolis 6, Indiana.

THE HOSPITAL PHARMACIST'S BILL OF RIGHTS

The "Minimum Standard for Pharmacies in Hospitals," established by the American Society of Hospital Pharmacists and approved by the accrediting agencies, is one of the most significant factors in establishing the pharmacist as a key man in the hospital organization. It is, in actuality, the hospital pharmacist's bill of rights. This document is the foundation for the strong professional program all good pharmacists desire. Consider what it does for you, the hospital pharmacist:



"1. **Organization.** There shall be a properly organized pharmacy department under the direction of a . . . qualified pharmacist . . ."

This recognizes the pharmacy as a department and establishes the pharmacist as a *department head*, on an administrative level with all other department heads.

"2. **Policies.** The pharmacist in charge, with the approval of the director of the hospital, shall initiate and develop . . . the administrative policies of the department . . . [and] the professional policies of the department."

Here a chain of command is set up. The pharmacist is authorized to initiate both administrative and professional policies for his department. In administrative matters, the pharmacist is responsible only to the director of the hospital; in professional matters, he works in co-operation with members of the other professional staffs.

"3. **Personnel.** The pharmacist in charge . . . shall have such assistants as the volume of work in the pharmacy may dictate."

A very important point is made under this heading—that is, the pharmacist should have adequate help. The pharmacist should recommend the number of assistants necessary to supply pharmaceutical service of the highest quality.

"4. **Facilities.** Adequate pharmaceutical and administrative facilities shall be provided for the pharmacy department . . ."

Specific types of facilities are then listed. The important thing about this section is that it specifies the general classes of supplies the pharmacy department should have. It will be hard for any conscientious administrator to deny a request for items in these categories, particularly if the request is accompanied by a copy of the "Minimum Standard" with the appropriate items underlined.

5. **Responsibilities.** If ever a hospital pharmacist wanted documentary proof of the wide range of his responsibilities in the hospital, he would only have to refer to this section, which once and for all dispels the idea that the sole function of the pharmacist is to supply drugs as ordered.

"6. **Pharmacy and Therapeutics Committee.** There shall be a Pharmacy and Therapeutics Committee, which shall hold at least two regular meetings annually and such additional meetings as may be required."

A copy of the "Minimum Standard for Pharmacies in Hospitals" should be on the desk of every hospital pharmacist, and it should be carefully studied and interpreted. It will serve as a guide for organizing a pharmacy service and as a tool for strengthening it. Its authority—and the authority it gives the pharmacist—cannot be disputed.

Eli Lilly and Company

TRUE OR FALSE?

Each of the following statements has been constructed on the basis of confirmed facts. Indicate whether you believe them to be true or false; then check your answers against the correct ones listed. If you have fewer than ten correct answers, you would do well to take stock of yourself.

1. The "Minimum Standard for Pharmacies in Hospitals" lists the minimum requirements under which a pharmacy may be legally operated in a hospital. _____

2. The American Society of Hospital Pharmacists was founded at Ann Arbor, Michigan, in 1942. _____

3. Approximately 60 percent of all the hospitals in the United States have a bed capacity of 100 or less. _____

4. There is a significant trend toward the establishment of physicians' private offices in or near hospitals. _____

5. Today, hospitals purchase over 20 percent of all the "ethical" prescription drugs produced in the United States. _____

6. The Joint Commission on Accreditation of Hospitals specifies that there shall be an automatic stop order on dangerous drugs. _____

7. Medication errors resulting from a nurse's mistake are no concern of the pharmacy department. _____

8. If a chief pharmacist utilizes unskilled and unlicensed personnel as pharmacists in his department, he is guilty of a criminal offense. _____

9. Refilling prescriptions for legend drugs for hospital outpatients without authorization from the prescriber is permissible as long as the patient is ambulatory. _____

10. The hospital pharmacy cannot prepare sterile ophthalmic solutions unless a separate sterile room for such items is provided. _____

11. The "charitable immunity doctrine" holds to the theory that a charitable institution cannot be held liable for injuries to its patients caused by negligence of its employees. _____

12. To protect himself, the hospital pharmacist should carry malpractice insurance. _____

13. When a verbal order is received for an emergency medication, a written requisition for the medication should be available by the time the drug is delivered. _____

14. The administrator of the hospital is legally responsible for the proper handling of narcotics in the hospital. _____

15. Patients in voluntary short-term hospitals average a higher total daily expense than do those in other types of hospitals. _____

ANSWERS

1. **False.** The "Minimum Standard" is a statement of minimum requirements for pharmaceutical service but is not a statement of legal standards.

2. **False.** The date is correct, but the place was Denver, Colorado, during the annual A.Ph.A. convention.

3. **True.** Statistics of the American Hospital Association for 1959 list hospitals in seven groups according to bed capacity; over 60 percent have fewer than 100 beds.

4. **True.** This statement is part of a most interesting article by William Heller on the future of hospital pharmacy, which appeared in the summer, 1960, issue of the *American Journal of Pharmaceutical Education.*

5. **True.** It is predicted that this percentage will increase still more.

6. **True.** The standards for pharmacy are listed in the commission's bulletin, No. 16.

7. **False.** A medication error *anywhere* in a hospital should be of concern to the pharmacy department.

8. **True.** This has been repeatedly emphasized by Dr. George F. Archambault and is embodied in his paper, "The Legal Responsibilities of Hospital Pharmacists in the United States."

9. **False.** Refills of prescriptions for legend drugs must be handled in the same way for hospital outpatients as they are for retail pharmacy customers.

10. **False.** A simple and effective process is reported in the September, 1960, issue of the *Journal of the American Society of Hospital Pharmacists.*

11. **True.** There is, however, a definite trend away from this theory in many of our courts.

12. **True.** The hospital pharmacist, as a professional practitioner, must insure himself against malpractice suits.

13. **True.** Provision for this should be made in the pharmacy's policies.

14. **True.** The administrator is the legal head of the hospital. He may delegate this responsibility to the pharmacist.

15. **True.** In 1959, the average was $31.16 per patient day—almost double the average for all hospitals combined.

a solution

to the problem

of resistant

infections

VANCOCIN®

(vancomycin, Lilly)

Description

Vancocin is a bactericidal antibiotic obtained from strains of *Streptomyces orientalis*.

Indications

Vancocin is particularly useful in the treatment of infections caused by staphylococci which are resistant to the commonly used antibiotics or when staphylococci resistant to other antibiotics are known to be a problem in the hospital environment. Vancocin has been found to be clinically effective in a variety of serious staphylococcus infections, including endocarditis, pneumonia, arthritis, osteomyelitis, enterocolitis, septicemia, and soft-tissue infections.

Side-Effects

Rapid injection of Vancocin may occasionally cause nausea or a feeling of warmth and generalized tingling in some patients. Thrombophlebitis, which may be associated with repeated or prolonged administration, can be minimized by using dilute solutions and alternating the sites of injection. On occasion, chills, fever, urticaria, and macular rash have occurred but have cleared with discontinuance of the drug or with the administration of antihistamines. These effects may sometimes appear in an unpredictable fashion, beginning with the first dose of Vancocin. When this drug is administered, precautions should be observed regarding anaphylaxis. Hearing loss may occur in the presence of excessively high serum levels of Vancocin. These levels may be prevented by avoiding daily dosages greater than 2 Gm. and by the use of reduced dosages in patients with impairment of renal function. Patients with renal insufficiency, individuals over the age of sixty, and those with borderline renal disease should have serial measurements of Vancocin serum levels and renal and auditory function.

Administration and Dosage

Vancocin is administered only by the intravenous route. Bactericidal levels are achieved and maintained by the intravenous use of 500 mg. every six hours, 1 Gm. every twelve hours, or 2 Gm. daily by continuous infusion. For infections in children, Vancocin may be used in a dosage of 20 mg. per pound of body weight daily. Reduced dosages, titrated according to serum levels of Vancocin, should be employed for patients with diminished renal function.

At the time of use, 10 ml. of Sterile Water for Injection, U.S.P., are added to the ampoule of dry, sterile Vancocin powder. Further dilution is required as follows:

Adults:

1. **Intermittent Infusion**—One ampoule (containing 500 mg. Vancocin) can be added to 100-200 ml. of Sodium Chloride Injection, U.S.P., or 5 percent glucose in Sterile Water for Injection, U.S.P., or two ampoules (1 Gm. Vancocin) can be added to an appropriate volume. This intravenous infusion may be given over a period of twenty to thirty minutes.
2. **Continuous Infusion**—Two to four ampoules of the above (1 to 2 Gm.) can be added to a sufficiently large volume of Sodium Chloride Injection, U.S.P., or 5 percent glucose in Sterile Water for Injection, U.S.P., to permit the desired daily dose to be administered slowly by intravenous drip over a twenty-four-hour period.

Children: Vancocin can be administered in divided dosage by intermittent infusion, or the total daily dose can be added to the child's daily fluid requirement and administered by continuous drip over twenty-four hours.

How Supplied

Vancocin, I.V., 500 mg., is supplied in 10-cc. rubber-stoppered ampoules.

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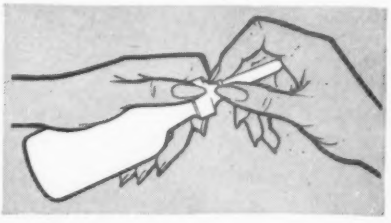

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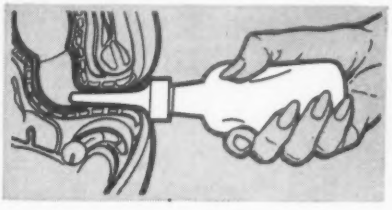
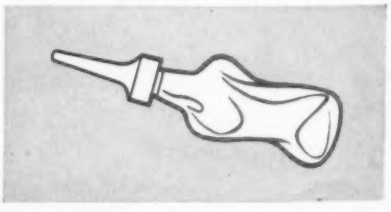


2. ***Easy to administer*** . . . by nurse or patient . . . takes less than a minute . . . just squeeze bottle with one hand



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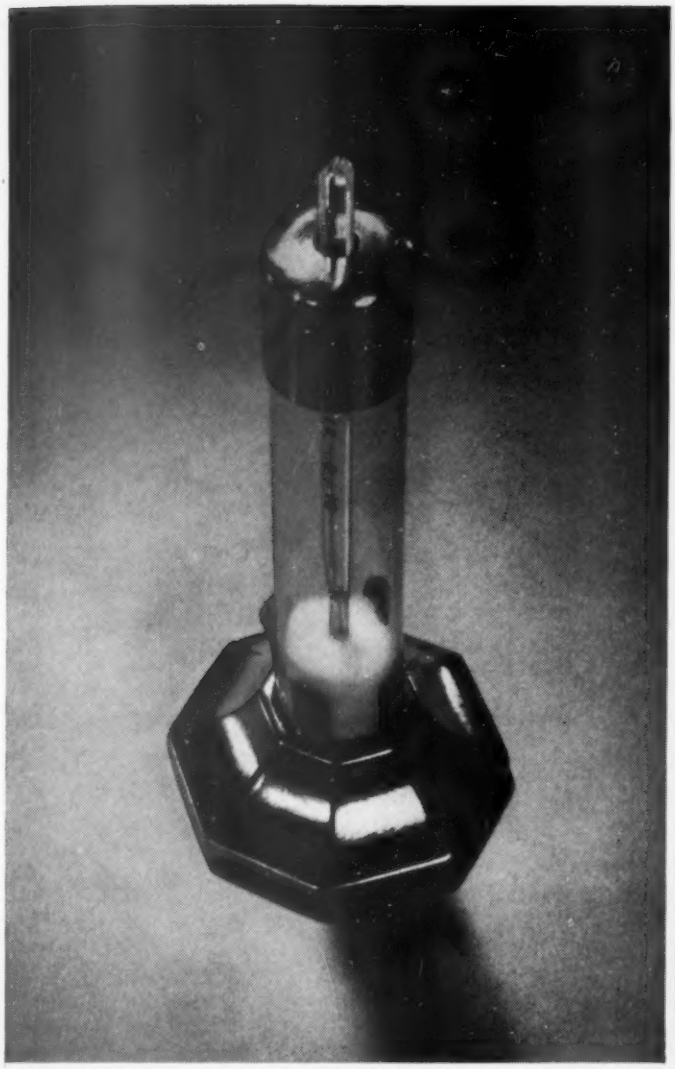

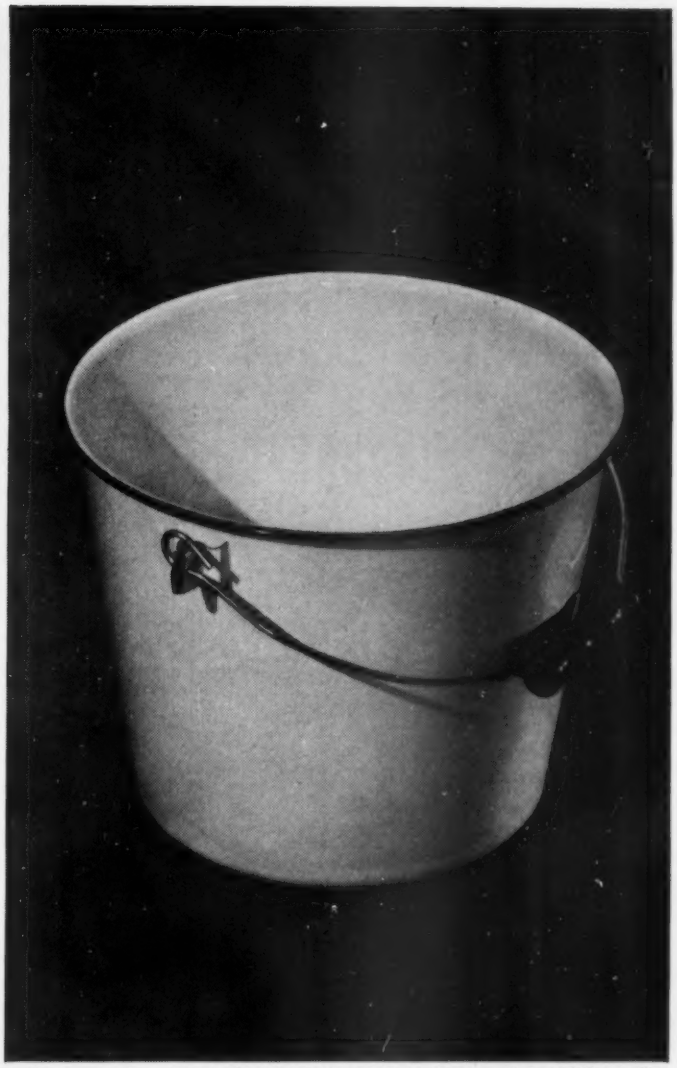

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1. Baer, S., et al.: J.A.M.A. 167:704, June 7, 1958. 2. Moser, K. M.: Disease-a-Month, Chicago, Yr. Bk. Pub., Mar., 1960, p. 13.

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Average Dose: Initial, 40-60 mg. For elderly and/or debilitated patients, 20-30 mg. Maintenance, 5-10 mg. daily, or as indicated by prothrombin time determinations.

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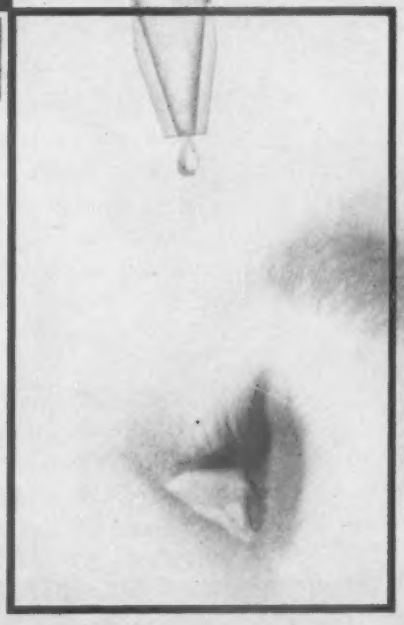

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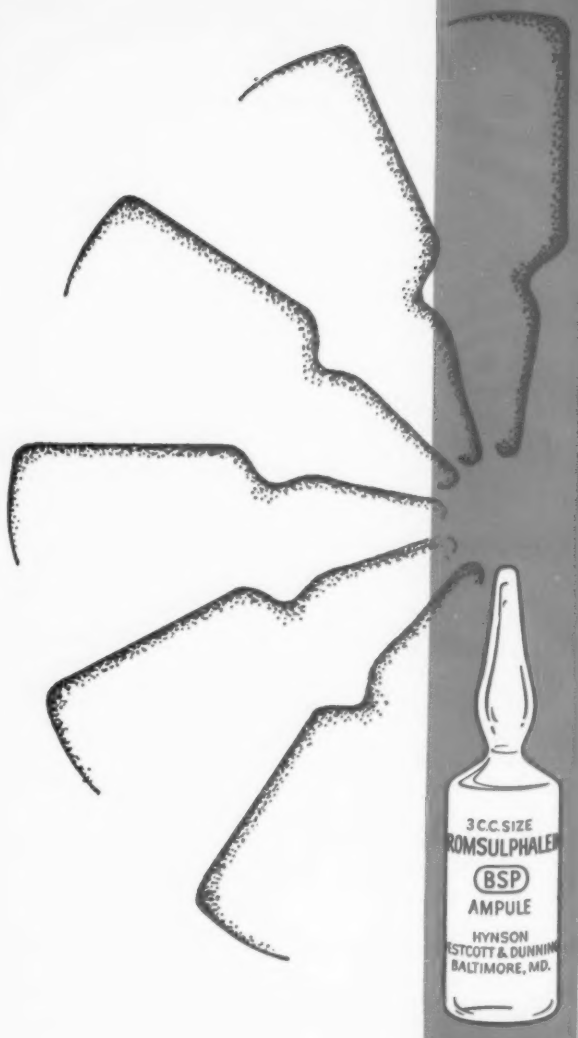

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Dade County Society

The Dade County Society (Miami, Florida) Society of Hospital Pharmacists and the Miami Chapter of the American Pharmaceutical Association met jointly on March 14. The meeting was held at the McKesson and Robbins building in Miami.

Business transacted at the hospital pharmacists' meeting included a review of the proposals of the Dade County Society for new legislation which is being introduced by the Florida State Pharmaceutical Association. Other business included appointment of Mr. D. M. Fisler and Mr. Carl Dell as delegates to the Annual Meeting of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. Miss Mary Wernersbach was named to represent the Dade County Society at the meeting of the Southeastern Society of Hospital Pharmacists being held in Memphis in April.

Included on the program was a tape recording with accompanying slides on Insulin Zinc Suspension U.S.P. This was presented by Mr. John Ross, a representative of Eli Lilly and Company.

Indiana Chapter

Members of the Indiana Chapter of the American Society of Hospital Pharmacists met at Purdue University on March 23 in conjunction with the Professional Pharmacy Clinic. During the business session, the program for the Pharmacy Section of the Tri-State Hospital Assembly, which is sponsored by the Indiana Chapter this year, was discussed. Also, routine announcements were made with regard to preference for meeting time, the course in "The Preparation of Parenteral Products," which is offered at the Philadelphia College of Pharmacy and Science, and contributions to Project HOPE.

New officers elected who will take office in June 1961 include *President* Dan Hansell of Remington, *Vice-President* Bern Grubb of Logansport and *Secretary-Treasurer* Mildred Wiese of Indianapolis.

Announcement was made that the next meeting of the Indiana Chapter will be held in conjunction with the Convention of the Indiana Pharmaceutical Association in Indianapolis in June.

Massachusetts Society

The Massachusetts Society of Hospital Pharmacists met at the McLean Hospital in Waverly for the February meeting. The program included a talk on "Remembering Made Easy" by Joseph P. Vona of Roche Laboratories.

Routine reports, including one from the Legislative Committee by Mrs. Ethel Pierce, and a report of the Program Committee by Mr. George Narinian, were presented.

The March meeting of the Massachusetts Society was held at the Massachusetts General Hospital in Boston. Following a dinner sponsored by Lederle Laboratories, Mr. Theodore Walker spoke on "What the Hospital Pharmacist Should Know About the Narcotic Laws."

Greater Kansas City Society

Members of the Society of Hospital Pharmacists of Greater Kansas City met at the Blue Cross-Blue Shield Building on Wednesday, February 8 at 2:30 P.M. Business included routine reports from officers and the president reported on progress made toward the formation of a local chapter of the American Pharmaceutical Association. The meeting of the officers from the local organizations included the Pharmacy Guild, retail druggists, the American College of Apothecaries, and the Society of Hospital Pharmacists. Also, representatives have been invited from the Kansas side.

Included on the program was a film on "Electrolytes and Fluid Replacement," shown through the courtesy of Abbott Laboratories.

Greater New York Society

Members of the Greater New York Chapter of the American Society of Hospital Pharmacists, in place of the regular monthly meeting, attended the Pharmacy Congress, St. John's University Campus, Jamaica, on March 17, 1961.

The panel on hospital pharmacy moderated by Norman Baker and the luncheon talk, "A Year of Decision," by Dr. Austin Smith, were fresh stimuli for the members to play their dual role, administrative and professional, with pride and dignity.

Southeastern New York State Chapter

"The Hospital Pharmacist's Role in Nursing Education," was the subject for a panel discussion at the February 23 meeting of the Southeastern New York State Chapter of the American Society of Hospital Pharmacists. The panel included the following representatives of nursing, pharmacy, and industry: Mrs. Almeda Martin, director of nursing, Lenox Hill Hospital; Mrs. Elizabeth Staats, director of nursing, Montefiore Hospital; Mr. Harold Neham, director of pharmacy services, University Hospital, New York City; Mr. Gil Simon, director of pharmacy services, Lenox Hill Hospital; and Mr. Ralph Davies, hospital sales representative, Pfizer Laboratories. The panel, moderated by Mr. Joel Yellin, also included a question and answer period. Emphasis was placed on the nurses' needs for information on new products, instructions on calculations, and potential helpfulness in the reduction of medication errors. Possible aides in supplying this information through the pharmacy included suggestions for services from the pharmaceutical manufacturers and also the possibility of student nurses spending some time in the pharmacy.

Business transacted during the meeting included a report from the Nominating Committee headed by Mr. Norman Baker, a report on the December meeting of the Executive Committee of the New York State Council of Hospital Pharmacists, and announcement of future meetings. The meeting was held at Lenox Hill Hospital with President Albert Kossler presiding.

Members of the Southeastern New York State Chapter of the American Society of Hospital Pharmacists met at the New York Hospital-Cornell Medical Center on Wednesday, March 29. Announcements and correspondence included information on the suits filed by the Department of Justice against the Idaho and Utah State Pharmaceutical Associations, a report on the New York State Council of Hospital Pharmacists, and plans for the forthcoming Institute on Hospital Pharmacy to be held in Albany during the week of June 19. The new officers elected to serve during the coming year include *Presi-*

dent Albert Kossler, *Vice-President* Robert Leventhal, *Secretary* Joel Yellin, and *Treasurer* Goldie Goldman. Mr. Robert Bogash was appointed to represent the Chapter at the ASHP Annual Meeting in April.

The program for the evening was a round table discussion moderated by Mr. Norman Baker. The discussions were opened by directing comments towards, and attempting to further define the title of the afternoon presentation of the recent St. Johns Pharmacy Congress—"Hospital Pharmacy: The Relationship of Its Service Activities and Professional Practices." Throughout the lively discussions following, the roles of the pharmacist as an administrator and as a professional member of the health team were compared as two separate functions. The direction of the discussions seemed to deemphasize these roles as separate entities.

During the evening a diversity of topics was discussed, i.e. inventory controls, educational functions of the pharmacist in relation to nurses and physicians, future programs, relations with social service regarding welfare classifications, and the "right" of individuals to medical care.

Akron Area Society

Members of the Akron Area Society of Hospital Pharmacists met at St. Elizabeth Hospital in Youngstown on March 14. Routine reports included one from the treasurer, a report on public relations by Wayne Eaton, a statement on the work of the Committee on Nominations by Corrine Rho, a report on the work of the Emergency and Disaster Committee by Charles King, and plans for a banquet scheduled in May by Ed Bolchazi.

There was also considerable discussion and plans regarding the annual student project which was presented by Mary Morgan, chairman. This will include tours of various hospital pharmacies with emphasis on specific activities at each place, a special dinner for students and members of the Akron Area Society at night, as well as a regular meeting.

Other business transacted included plans for a fall meeting with the Summit County Pharmaceutical Association, appointment of John McGowan as a delegate to the ASHP Annual Meeting, and plans for a trip to Lederle Laboratories in Pearl River.

The program included a discussion on "Pulmonary Function Laboratory," by Dr. Leonard P. Caccamo, associate director of medical education and director of the cardiac clinic at St. Elizabeth Hospital.

Central Ohio Society

Members of the Central Ohio Society of Hospital Pharmacists met at Howard Johnson's Lodge in Columbus on March 14 at 7:30 P.M. The program included a film on counterfeit drugs followed by a question and answer period. The guest speaker for the evening was Mr. Ted Slyman of Schering Corporation.

The business session included announcements regarding the postgraduate course on parenteral solutions which is being offered at the Philadelphia College of Pharmacy in the summer, the annual meeting of the Ohio Society of Hospital Pharmacists held in conjunction with the Convention of the Ohio Hospital Association in April, and Project HOPE.

Plans were also discussed regarding a proposed student visitation project at which time students in the college of pharmacy will have an opportunity to visit hospitals and meet with the hospital pharmacists in the area.

At the February 14 meeting of the Central Ohio Society held at Doctors Hospital in Columbus, the program included a discussion on "The History of Osteopathy and the Aspects of Osteopathic Medicine." This was presented by Dr. Jack Hutchison.

Western Pennsylvania Society

"Drug Advertising—The Use and Misuse," was the subject for discussion at the March 16 meeting of the Western Pennsylvania Society of Hospital Pharmacists. The panel was led by M. Goldstein and C. Cleveland.

The meeting was attended by twenty-four members and was held at the Montefiore Hospital in Pittsburgh. Business transacted included routine reports and announcements regarding future meetings.

Texas Society

At the February 24 meeting of the Texas Society of Hospital Pharmacists, the following recommendations were adopted and will be the Society's policy for the ensuing year:

1. Support of American Society of Hospital Pharmacists and American Pharmaceutical Association in the effort to support pharmacy in Washington.

2. Keep pharmacy (hospital pharmacy) professional, all members.

3. Attempt to do something about sale of legend drugs to hospitals and clinics where no registered pharmacist is on duty.

4. Continued support and affiliation with the Texas Pharmaceutical Association and its Legislative Committee in the work being done in Austin on the state level.

5. Encourage each hospital pharmacist to hold membership in the Texas Pharmaceutical Association and his local county or area pharmaceutical association. This enables us to keep up with what is going on at each phase of pharmacy.

6. Urge continued support and close coordination with the dental and medical professions in the fight against governmental control in Washington.

7. Last, but not least, we recommend that a hospital pharmacist be placed on the State Board of Pharmacy, and the term of the State Board members be limited to one term of six years. Hospital pharmacy does 25 percent of the total volume of business in pharmacy and wants to go on record as wanting representation.

New officers of the Texas Society installed for the coming year include *President* William A. Leisch; *Vice-President* Col. Reuben G. Lewis; *Secretary* Kenneth E. Tiemann; and *Treasurer* Blanche Grosso.

William T. Clark, Jr., past president of the Society, was selected as delegate to the A.Ph.A. Convention in Chicago and Leo Godley was named alternate delegate.

Wisconsin Society

Members of the Wisconsin Society of Hospital Pharmacists met on March 17 at St. Mary's Hospital in Milwaukee. The program was designed to acquaint members with the new Burn Therapy Center at St. Mary's. This is an intensive care unit and is the first of its kind in the Midwest. The Center was donated by the Wisconsin Electric Power Company as a community service contribution. Slides showing the physical features included: the air purifying system, the stainless steel tank with whirlpool unit, special beds, artificial kidney; treatment and dressing area, and mechanical respirator.

Following the program, members enjoyed a coffee break and President Sister Natalie asked each member to introduce himself.

Business transacted included report on the progress on the Wisconsin Pharmacy Directory, appointment of Mr. Dell Olsheski and Mr. Dick Henry to assist with plans for the October Hospital Pharmacy-Hospital Administrators Institute in Madison, appointment of a nominating committee and reading of communications.

Mr. Fred Fornal, district manager of Geigy Company, presented an engraved mortar and pestle award to Sister Natalie as President.

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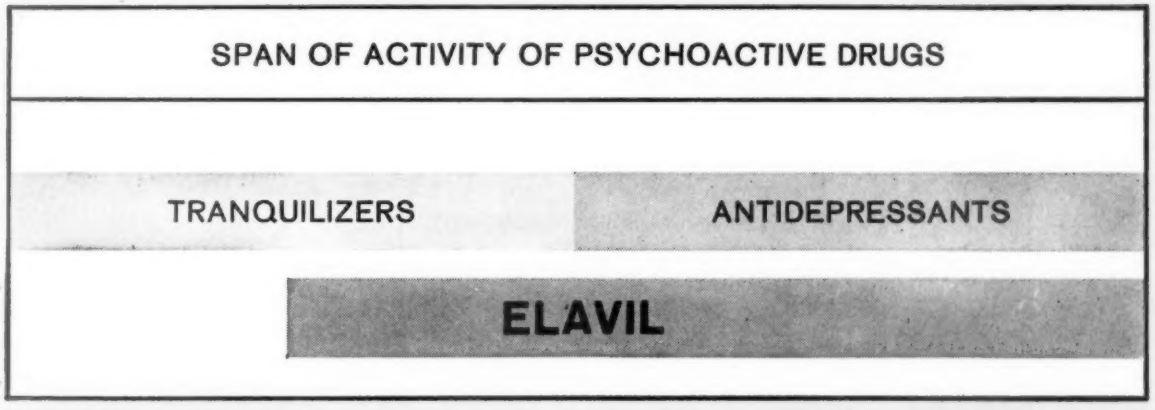

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REFERENCES: 1. Perloff, M. M., and Levick, L. J.: Clinical Med. 7:2237, Nov. 1960. 2. Freed, H.: Am. J. Psychiat. 117:455, Nov. 1960. 3. Dorfman, W.: Psychosomatics 1:153, May-June 1960. 4. Ayd, F. J., Jr.: Psychosomatics 1:320, Nov.-Dec. 1960. 5. Barsa, J. A., and Saunders, J. C.: Am. J. Psychiat. 117:739, Feb. 1961.

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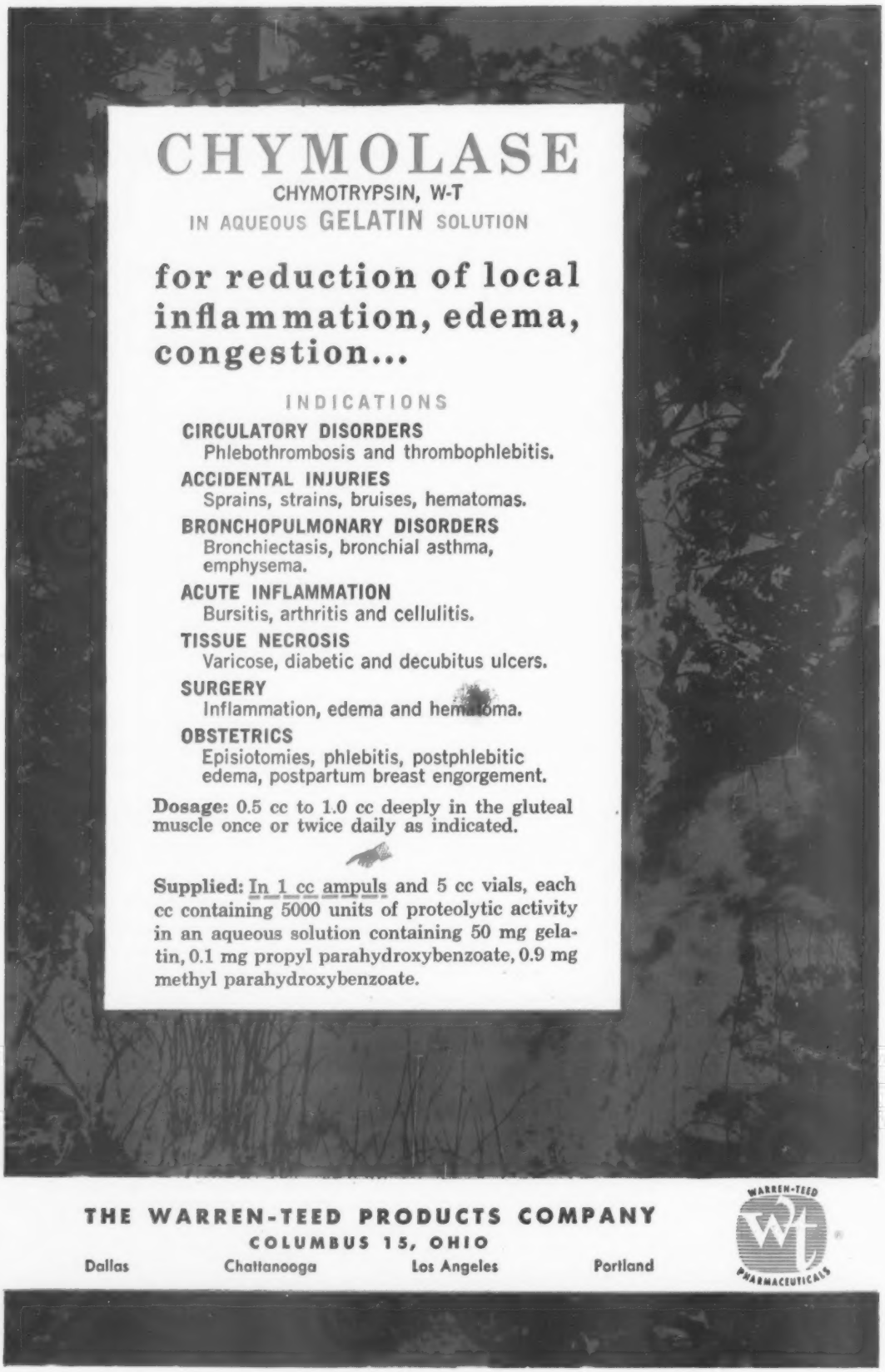

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References: 1. Pitts, R. F., Am. J. Med., 24:745, 1958. 2. Ford, R. V., Cur. Therap. Res., 2:51, 1960.

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1. Simeckova, M.; Shaw, W.; Pool, E., and Nichols, E. E.: Numorphan in labor, Obst. & Gynec. 16:119, July, 1960. 2. Snow, D. L., and Sattenspiel, E.: A report on Numorphan in obstetrics, presented at the Congress of the Pan American Medical Association, Mexico City, May, 1960.

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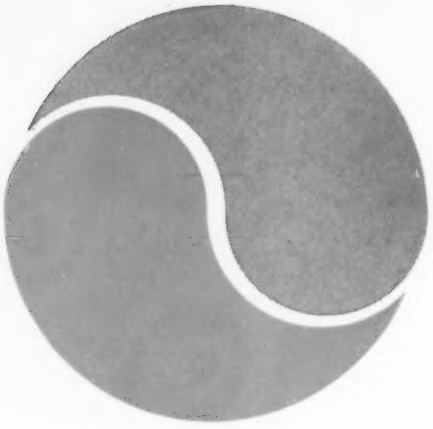

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LAKESIDE

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. . . . . .

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MEMBERSHIP DUES

New Members of the SOCIETY as well as those who are delinquent will want to note the following excerpt taken from the ASHP By-Laws, Chapter V, Article 4:

"The period of membership shall coincide with the period of membership in the American Pharmaceutical Association. Dues are payable and due on the anniversary date of this period. Membership in the SOCIETY and the obligation for dues will continue from year to year unless a member's resignation, signed by the member, is received by the Secretary prior to the end of the year for which dues have been paid.

"Any member in arrears for dues shall cease to be a member of the SOCIETY, provided that at least two weeks before his name is removed from the rolls, the Secretary shall send him a written notice of his delinquency together with a copy of the By-Laws pertaining to the subject. Such a person may be reinstated as a member provided his arrears have been paid and payment of current membership dues is made."

Lehn & Fink
PROFESSIONAL DIVISION

staph newsletter

TWELFTH OF A SERIES WITH SIGNIFICANT SUGGESTIONS FOR CONTROLLING CROSS INFECTIONS

EVER since the first Staph Newsletter, the "significant suggestions" we have been privileged to offer you on staph control have seldom emphasized the phage types and strains of staph or their varying antibiotic susceptibility. Just as you probably do, we consider any strain of staph potentially dangerous and the judicious use of antibiotics the province of the physicians and the Infection Control Committee. In the March 11th issue of The Journal of the American Medical Association (page 886), Doctors Wallmark and Finland reveal the interesting results of comparing strains of the previous ten years with 1959-1960 at Boston City Hospital. 1550 strains were isolated. Among their significant conclusions are:

The proportion of strains of staphylococci resistant to the widely used antibiotics has continued to increase.

The lowest proportion of resistant strains was obtained from outpatients, the proportion increased with length of hospitalization and was highest in the strains obtained at autopsy.

As sensitive staph strains are eliminated by antibiotics, resistant staph persist, multiply and spread.

Fortunately, there is published evidence that staph organisms which have become resistant to antibiotics do not *ipso facto* become resistant to any one of the L&F phenolic disinfectants—Amphyl®, O-syl®, Lysol®, or Tergisyl® detergent-disinfectant. All are broad spectrum microbicides which are not only staphylocidal but also pseudomonacidal, tuberculocidal and fungicidal. And we do have this suggestion—

Write today for your copy of our new infection control kit titled, "Contamination Control That Works...in your Hospital". In a conveniently index-tabbed jacket we've collected a variety of pertinent materials. Whether you're interested in general housekeeping, isolation units, O.R. and recovery, O.B. and maternity, nursery and pediatrics, emergency and outpatients, laundry, or the whole hospital —you'll find in this kit specific "how, where, and when" information on dependable contamination control. Reprints report successful control of infection in well-known hospitals, and how it is being done. Brochures give specific procedures easy to follow in any hospital. The kit is suitable for use by the Infection Control Committee in re-evaluating environmental control throughout the hospital. We'll be glad to send each member an individual copy if you ask us. Please do.

When you're talking to some of the doctors in your hospital, you may want to tell them about a special clinical symposium, "The Hazards of Infection", scheduled for Sunday, June 25, at the Savoy Hilton Hotel in New York City. This is the final session of the annual meeting of the American College of Angiology and the International College of Angiology which precedes the annual AMA meeting. The complete two-hour program with names and professional affiliations of the participants is too long for mentioning here, but if you would like these details please let us know. Perhaps you, too, will want to be there.

From the time our new spray-on form of Amphyl was first discussed in the L&F research lab, I agreed with many of our hospital friends who felt that Amphyl Spray would take care of a lot of difficult disinfection problems. Particularly—odd-shaped surfaces, hard-to-reach areas, also for immobilizing organisms immediately after accidental spills of infectious material, and prior to disinfection, e.g., by flooding. The versatility of Amphyl Spray as a deodorant is also "inspiring" many hospitals. For instance, on the orthopedic service it is being sprayed directly onto the patient's cast to offset malodors. Amphyl Spray lends itself well to this use since it leaves no sticky or greasy residue and no evidence of its having been used except the reduction in odor. As a disinfectant, Amphyl Spray is handy for frequent drenching of the base and understructure of the operating table. Be sure to send for our new bulletin on specific Amphyl Spray procedures.

In a study of one thousand consecutively operated cases from the General Surgical Wards of the University Hospital in Oklahoma City, the infection rate in 537 clean wounds ranged from 3.1% without preoperative antibiotics to 4.0% with preoperative antibiotics. In the 463 contaminated wounds, infections complicated the surgical wound in 11.9% when antibiotics were used postoperatively and in 5.0% when not used. In the clean wounds, infection was nine times greater among patients who received antibiotics postoperatively. In discussing this study, the authors say that it is becoming obvious that their use (prophylactic antibiotics) offers no real protection against the appearance of a wound infection. (American Surgeon 12:781, December, 1960)

Routine de-contamination of floors, objects, surfaces, blankets, and linens can be one of the most economic, effective, and simple control measures against infection and superinfection. Here's why—it reduces the number of organisms available for spread by any route—contact, nasal, or airborne—thus reducing both the excess hospital days and the risk of debilitating infection in both the patient and the hospital personnel.

Please write us for any of the information offered in this letter. If you want copies for teaching purposes or group discussion, please let us know how many you will need. When you have additional questions, our research laboratories and technical advisors are ready to help. I, personally, would like to hear from you at any time.

Robert E. Dickens
General Sales Manager
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Dear Sirs:

Reply to Dr. Slesser's Letter on Brand Names

DEAR SIRS: I am pleased (and not surprised) to learn from Dr. Slesser the extent of control exercised in his company over changes in both inactive and active ingredients of pharmaceuticals made by his company. [See THIS JOURNAL, page 213 (Apr.) 1961.] Perhaps Dr. Slesser would prefer that I had said that a trade name owner may change a formulation, both inactive and active ingredients, at his *discretion,* rather than at his *whim*—discretion implying that more care was used in arriving at the decision to change. However, until manufacturers supply practicing pharmacists (or physicians) responsible for brand selection with the "formal report presenting convincing evidence that the change is worthwhile and does not alter the product's stability or efficacy," we can only infer that most of the changes are more whimsical than discreet.

The point of my original comment was to the effect that there are a limited number of USP and NF dosage forms in which all ingredients, inactive and active, are specified as to quality and amount. These cannot be changed at the discretion of any one manufacturer, but are changed only when the members of the revision committees of the respective compendia are convinced of the desirability of the change. Even when complete formulations are not laid down by the USP or the NF, the legal specifications and tests they establish are in like manner preferable to the specifications set up by any one manufacturer.

The product of each manufacturer is his brand, whether he markets it under a trade name or only under a nonproprietary name. It is undeniable that there are differences among brands of the same drug product. And as has been brought out in Dr. Levy's paper and in this discussion, it is also true that there are differences in the formulation of the same brand from time to time. In both instances, the differences are pharmaceutical, but sometimes have therapeutic implications. Thus the combined best judgment of the prescribing physician and the dispensing pharmacist must be continuously employed in the endeavor to select the best brand. In order for the pharmacist to contribute more fully in this effort, manufacturers should make available the research supporting the *pharmaceutical* advantages of their brand, rather than depending on advertising budgets, palpable and impalpable payola, high pressure salesmen, or scare and smear—tactics which have been used by both "big name" and "no name" manufacturers of both brand name and nonproprietary name products.

WILLIAM M. HELLER, Ph.D., *Chief*

Pharmacy Service
University of Arkansas Medical Center
Little Rock, Arkansas

Placement Service Appreciated

DEAR SIRS: It is my pleasant duty to tell you that I have accepted what I consider will be an interesting position . . . and I want to thank you for the help extended through the Placement Service. This was greatly appreciated.

ROBERT M. DICKMAN, *Pharmacist*

Rockford, Illinois

DEAR SIRS: We have filled the position of staff pharmacist which we registered with your Personnel Placement Service and I wish to notify you of this fact as requested in a previous letter. . . . Thank you for this very fine service.

E. J. MEISTER, *Chief Pharmacist*

San Joaquin General Hospital
Stockton, California

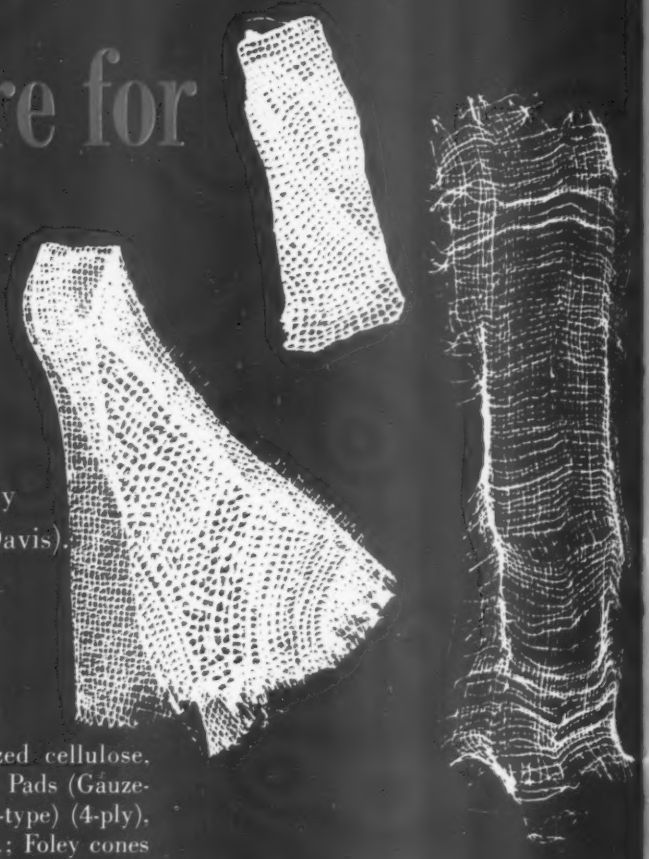
DEAR SIRS: I have taken advantage of the service placement offered through the Division of Hospital Pharmacy and I want to take this opportunity to wholeheartedly thank you for your efforts on my behalf . . .

BENJAMIN KAUFMAN, *Pharmacist*

1485 Nelson Ave.
Bronx 52, New York

EDITOR'S NOTE: The Personnel Placement Service is offered through the Division of Hospital Pharmacy of the American Pharmaceutical Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, 2215 Constitution Ave., N. W., Washington, D. C. See page 314 of this issue of THE JOURNAL.

arresting measure for surgical bleeding



When the customary surgical techniques for capillary hemostasis fail, prompt cessation of oozing may usually be obtained with OXYCEL (oxidized cellulose, Parke-Davis). This absorbable hemostatic conforms readily to all wound areas...assures a clear operating field...helps to shorten operative procedures.

Available in forms for every need: OXYCEL (oxidized cellulose, Parke-Davis). Pledgets (Cotton-type), 2¼ in. x 1 in. x 1 in.; Pads (Gauze-type) (8-ply), 3 in. x 3 in. and 4 in. x 12 in.; Strips (Gauze-type) (4-ply), 5 in. x ½ in., 18 in. x 2 in., 36 in. x ½ in., and 3 yd. x 2 in.; Foley cones (Gauze-type) (4-ply), 5 in. and 7 in. diameters. Sterile as supplied.

Indications: As an adjunct to effect hemostasis in bleeding associated with capillary oozing. *Use:* Strips—temporary packing of bleeding cavities, nasal passages, and tooth sockets; pads—temporary packing of surgical beds as after biopsies and to cover more or less extensive areas as in laparotomies; pledgets—in neurosurgery and in dental work for small localized bleeding areas; Foley cones—in prostatectomy.

Precaution: Excess amounts should be removed prior to surgical closure to avoid foreign-body reaction. Not to be used in sites of infection or following silver nitrate or other escharotic chemical agents. Contraindicated in clean bone surgery when poor vascularization is present and in instances where rapid callus formation is desired. Should be used sparingly in open reduction of fractures and in cancellous bone. Will not withstand heat sterilization. Remove from container aseptically. FEB. 1961 (P-568)

PARKE-DAVIS

PARKE, DAVIS & COMPANY, Detroit 32, Michigan

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OXYCEL®

editorial

by DON E. FRANCKE

Manpower Needs for Hospital Pharmacy

► MORE THAN 10,000 PHARMACISTS (8679 full-time and 1770 part-time) will be in hospital practice by 1975 according to manpower studies carried out as part of the Audit of Pharmaceutical Service in Hospitals.[1] This is almost double the number practicing in hospitals in 1957. In the five year period from 1948 to 1953 there was an increase of about 400 in the number of full-time hospital pharmacists, while in the four year period from 1953 to 1957 the increase was close to 1300. These figures emphasize the rapid growth in the number of hospital pharmacists.

The predictions on future needs for hospital pharmacists are based on the numbers needed (1) to serve the additional 30,000 beds being added to hospitals each year, (2) to provide pharmacy service in hospitals now without a pharmacist, based on an estimated 3 percent growth in pharmacy service in this group of hospitals annually, and, (3) to replace those pharmacists now in practice who leave as result of death, or to enter some other activity. It is assumed that the present staffing pattern of 7.2 pharmacists per 1000 beds will remain unchanged.

The replacement factor for hospital pharmacists was found to be 9.8 percent, a figure much higher than that for retail practitioners. The average number of years hospital pharmacists remain in hospital practice is 10.1; the median number of years they remain in hospital practice is 7.8 years. These figures have been adjusted to remove those entering hospital pharmacy as replacements for those leaving.

If the growth in the number of pharmacists practicing in hospitals occurs as predicted it will have a great effect upon the profession of pharmacy as a whole and will place into sharper focus several current problems in hospital pharmacy. First, the number of new graduates of colleges of pharmacy who will go into hospital practice will increase greatly and will become a much more significant percentage of each year's graduating class.

Traditionally, American colleges of pharmacy have emphasized preparation of their students for retail pratcice. It is likely that the colleges will need to more strongly emphasize preparation for hospital practice. There is a probability that some colleges of pharmacy would do this to a greater extent than others and, thus, we may see the rise of colleges specializing in the education of hospital pharmacists at the undergraduate as well as the graduate level. It is also possible that at least one new college of pharmacy specializing in the education of hospital pharmacists may arise. Although such a college could supply only a small fraction of the manpower needs, its educational program could be a pacesetter for those entering the specialty.

An increase in the number of hospital pharmacists will affect retail pharmacy to the extent the number of facilities for the filling of outpatient prescriptions in hospitals increases. We believe these facilities are bound to increase and that increasing numbers of the American public will come to hospitals and outpatient clinic facilities for their medical care, including medication. It is not too unreasonable to predict that in the foreseeable future about 10,000 hospital pharmacists will be dispensing in the neighborhood of 50 percent of the ethical drugs produced in the United States.

As the demand for pharmacists in hospitals increases, hospitals will need to carefully review the salaries offered to pharmacists and realistically adjust them if they are to compete successfully with financial opportunities offered pharmacists in other specialities and, more important, if they are to attract the better qualified pharmacists to hospital practice. In addition, hospitals must provide incentive benefits, particularly at supervisory levels, to retain the services of career-oriented hospital pharmacists.

These manpower needs also provide challenges for practitioners of hospital pharmacy and their national professional organization. Practitioners must use their influence to provide better remuneration and they must strive to make hospital practice more attractive professionally. More of them must assume the professional obligation and responsibility of establishing high calibre internship training programs in hospital pharmacy. These efforts must be culminated in active recruitment programs spearheaded by the national professional organization, but made effective by the united effort of its members.

Hospital pharmacists have great opportunities to change the deeply rooted patterns of the past and to develop long-range goals for a truly professional practice of pharmacy in America.

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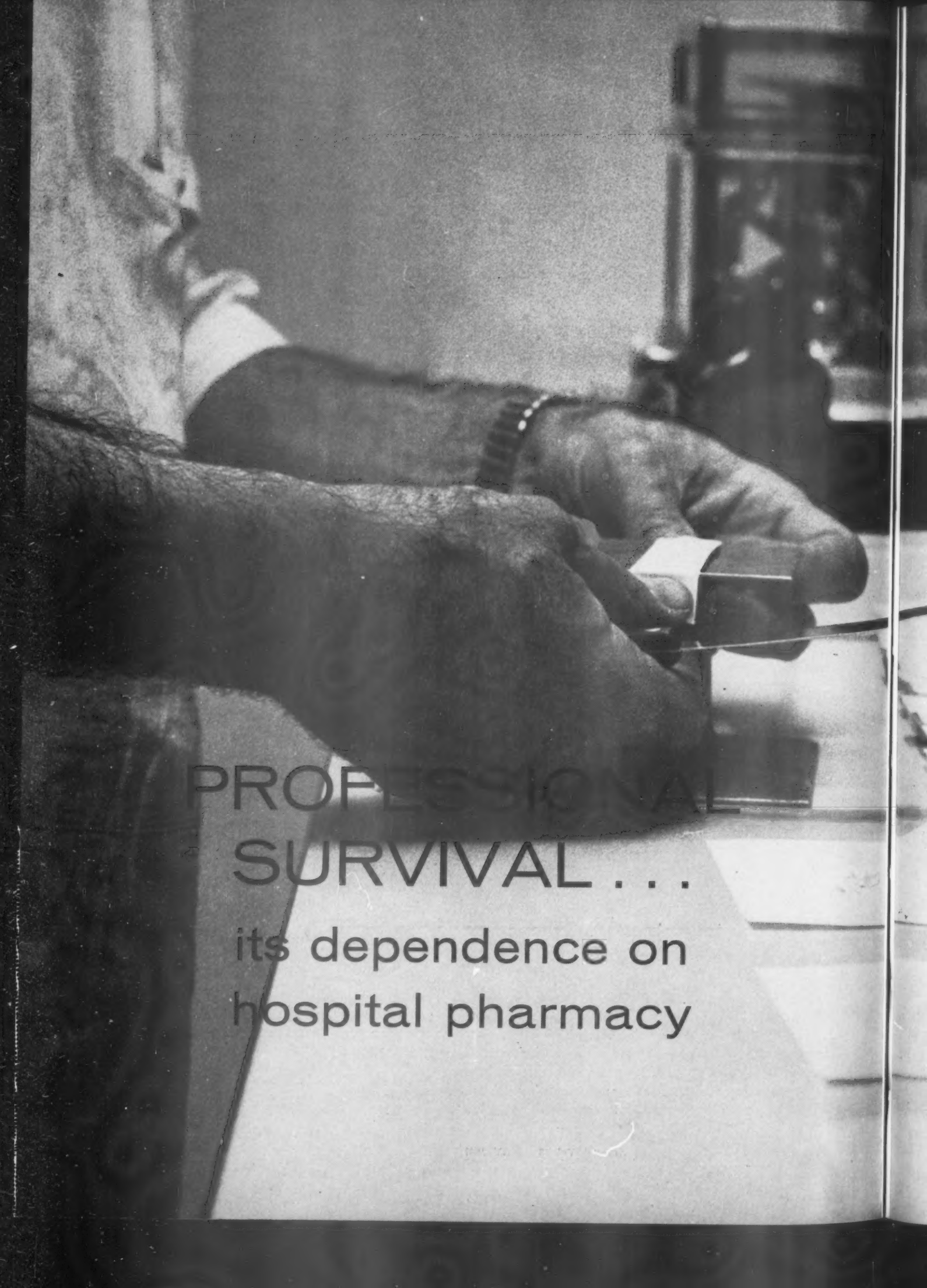
1. Results presented at Annual Meeting of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS in Chicago, April 1961 by Francke, D. E., Latiolais, C. J., Francke, G. F., and Ho, N. F. H.


PROFESSIONAL
SURVIVAL . . .
its dependence on
hospital pharmacy

by CLIFTON J. LATIOLAIS

► ALTHOUGH THE EXISTENCE of the American hospital covers a span of more than two hundred years, it has only been during the past three decades or so that we have witnessed a rapid expansion of our present vast and complex hospital system. While comparatively few hospitals existed prior to 1900, so were there few pharmacists practicing in the hospital. While the number of hospitals increased, so did the number of hospital pharmacists. Hospitals were not well organized, nor were hospital pharmacists. As the movement toward the organization, expansion and growth of the hospital system in the United States began to take shape, so also was there a movement toward the organization of hospital pharmacists. As Berman points out, the critical years for hospital pharmacy were the two decades from 1920 to 1940. The "Awakening in the Twenties" came about as a result of hospital pharmacists' growing realization of the problems, potentialities and importance of their specialty. The "Advances in the Thirties" resulted from their determination for organization, recognition and higher standards of practice.

The activities of the hospital pharmacists during these two critical decades resulted in the formation of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS in 1942. It has been stated that formation of the ASHP was one of the outstanding achievements in the history of American pharmacy. This statement, I think, is misleading. In itself, formation of the SOCIETY was just another accomplishment—another organization.

CLIFTON J. LATIOLAIS is Director of Pharmacy Service, Ohio State University Health Center, Columbus, Ohio.

Presented at the Eighth Annual Joint Pharmacy Seminar, Wayne State University, February 28, 1961, Detroit, Michigan.

It was the adoption of a philosophy of service by those hospital pharmacists during the twenties and thirties which made the formation of the ASHP a significant achievement. This "philosophy," if I may call it that, is not really a new concept of pharmacy service. It is a concept as old as the profession itself but which seemed to have been forgotten. These hospital pharmacists focused their attention on pointing up the difference between *interest* and *purpose*. Although there are many meanings of interest and purpose, the following quotations serve to illustrate what I have in mind:

One, "No enterprise can exist for itself alone. It ministers to some great need, it performs some great service, not for itself, but for others; or failing therein, it ceases to be profitable and ceases to exist."—Calvin Coolidge. And the second, "Interest does not bind men together. Interest separates men. Only purpose can unite men."—Woodrow Wilson.

Hospital pharmacists returned to the basic purpose for the existence of pharmacy as their primary objective. The purpose for the existence of pharmacy can be described in many ways, but essentially it is to provide pharmaceutical services as an integral part of the total patient care concept in the interest, safety and welfare of the public health. This is the philosophy of service which I referred to earlier. This is the philosophy which was imbued into the minds of the pharmacists entering hospital practice.

It formed the basis for the primary objective of the ASHP which has pioneered the development of an elite corps of properly oriented hospital pharmacists who are determined to live up to this philosophy. They realize that this is the only basis for the existence of pharmacy as a profession. It is because of this prime motivating force that we have realized tremendous progress in hospital pharmacy during the past two decades.

Speaking about interest and purpose, I cannot help but think not only about hospital pharmacy, but the profession as a whole. In the days when medicine was mostly an art with very little science, so also was pharmacy. While medicine has developed more and more on the scientific side, so also has pharmacy. While the scientific developments in medicine were incorporated into the practice of medicine, the scientific developments in pharmacy were incorporated into the pharmaceutical industry and not into the practice of pharmacy *per se*. While medicine has continually increased its services, professionally and scientifically, pharmacy has not increased its professional services to the public nor its scientific services to the physician. Instead, pharmacy expanded its efforts into a wide array of activities—commercial activities which have nothing to do with the basic purpose of pharmacy's existence. It would seem, however, that pharmacy's purpose for existence has been pushed back into a position of secondary significance and that personal interests have become the primary objective. In other words, many pharmacists have fused and confused our purpose with interest.

We have reached the point where pharmacy is not maintaining public support even in areas where support is essential in the interest of public health and safety. For example, take just a few of the problems pharmacy has been trying to solve during recent years:

—the dangerous aspects of the distribution of certain non-legend drugs.
—lowered requirements for licensure as pharmacists.
—mail order prescription schemes.
—dispensing of drugs by unqualified persons.
—counterfeit and inferior drug manufacturers.
—funneling of prescription drugs such as barbiturates and amphetamines to non-pharmacy outlets, such as truck stops.

Is pharmacy getting the public support it should with regard to the distribution of non-legend drugs in outlets other than pharmacies? Is pharmacy getting adequate public support in preventing unqualified individuals from becoming registered pharmacists in states such as Oklahoma? Is pharmacy getting adequate public support in preventing the establishment of dangerous mail order prescription operations? Is the public really concerned about preventing unsafe drug dispensing practices by persons other than registered pharmacists? Indeed, are many pharmacists themselves lending their support to eliminate these public health hazards?

It is questionable whether the public is giving adequate support, and there is no question that many pharmacists are giving no support, to eliminate these practices which are dangerous to the public health.

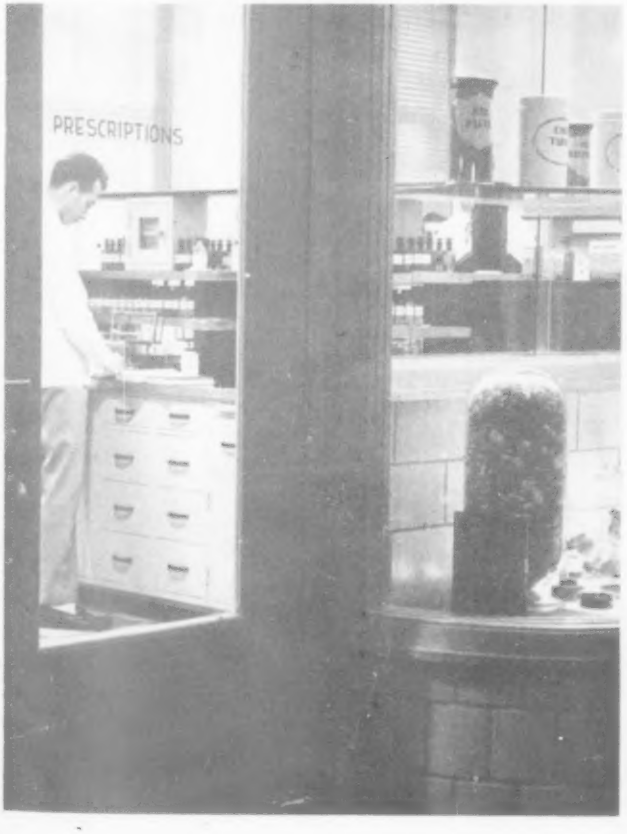
Why isn't the public lending its full support? Could it be that the public has reached the point where it is not completely convinced that the services of a qualified pharmacist are essential? Could it be that the public is beginning to wonder whether the pharmacist is providing such an essential professional service? Or could it be that the public is becoming more cognizant than some seem to believe that the pharmacist has adopted an "interest first—purpose second" philosophy?

It has been stated by Dean Linwood Tice with convincing evidence that the public image of pharmacy is pretty much dependent upon the medical profession's image of pharmacy. The more dependent the physician is on the pharmacist the more dependent will the public be on the pharmacist. To put it in the negative, the less dependent the physician is on the pharmacist, the less dependent the public is on the pharmacist. Because pharmacy has not kept pace with medicine in increasing its professional services to the public nor its scientific services to the physician, the slow, yet pro-

gressive trend over the years has not been an increase in the dependence of the physician on the role of the pharmacist in the overall patient care concept. Thus the survival of the role of the pharmacist as a professional hangs at the edge of a precipice. In terms of the future, how are we to meet the challenge of reversing this trend which has been in existence for so long that it can hardly be termed a trend?

It is conceivable that the solution to this dilemma might be achieved in a number of different ways. Whatever the solution may be, it should be a logical and practical one. I submit therefore, that the future survival of pharmacy as a profession lies to a major degree upon the dependence on hospital pharmacy.

Consider if you will that every future practitioner of medicine in the United States must obtain a substantial portion of his professional training in the hospital. This training begins during the clinical years of the student's educational career as a junior in medical school. This is where he begins to relate his basic biological science background to clinical practice. This is his first professional contact with the profession of pharmacy and this contact is the hospital. The medical student continues through his junior and senior years in medical school, as an intern in the hospital, and anywhere from one to five more years in a residency program. Thus, during the first three to eight years of his professional career, each future practitioner of medicine has his sole professional contact with pharmacy through the hospital pharmacist where he is taking his training. Thus, the way in which he is able to utilize the services of the pharmacist in his medical practice, the extent to which he develops a dependence on the pharmacist and the image he creates of the pharmacist as a professional practitioner, will determine to a major degree this physician's dependence or lack of dependence on the relationship between pharmacy and medicine during his entire professional career.



It is quite evident therefore, that in the hospital pharmacist's hands lie the future image of pharmacy in the minds of all the future practitioners of medicine. And if it is true that the more dependent the physician is on the pharmacist, the more dependent will the public be on the pharmacist, then there is a direct relationship between how the hospital pharmacist practices his profession and how dependent the public will be on pharmacy.

Further, if during his formative years as a physician-in-training, the young physician develops an increasing need for the services of the pharmacist, then he will demand this same type of professional service when he enters private practice. Thus the retail pharmacist who expects the support of this type of physician will have to expand his concept of what he considers professional pharmacy. In other words, retail pharmacy practitioners will be expected to provide the same level of professional services to this physician as he has been accustomed to from the hospital pharmacist. If he doesn't, he will not survive at least as a practitioner.

This, I submit can only come about when all of hospital pharmacy practice has been developed to the point where the physician, no matter in what hospital he obtains his training, will gain a favorable professional image and develop a dependence on pharmacy in his medical practice.

To accomplish this, I admit that we have still a long way to go in hospital pharmacy. However, during the past two decades or so, hospital pharmacy has emerged with a sound philosophy of professional practice, is developing an enthusiastic corp of dedicated practitioners, has made a comprehensive study of its present professional posture through the Audit of Pharmaceutical Service in Hospitals whose findings will be made available at the ASHP Annual Meeting in April. We are quite well aware of our weaknesses as well as our strengths. We are making a concerted effort to eliminate the undesirable practices, to improve the good ones and to polish the excellent within the framework of the basic purpose for which pharmacy exists—the patient first.

The strategic position which hospital pharmacy holds in the relationship between pharmacy and all the future practitioners of medicine is one of the major determining factors to the future survival of pharmacy as a profession. Through the development of excellent pharmaceutical service in all the hospital pharmacies in the United States the professional posture of pharmacy can be improved. It is a logical and practical solution to the problem of professional survival.

It would be naive however, for hospital pharmacists to think that they can accomplish such a goal by themselves. There is a need for all the segments of the profession to lend their support to the development of high quality pharmaceutical practices in hospitals. In addition, it is essential that they return to the philosophy of purpose over interest. Boards, colleges, industry, organizations, and particularly retail practice, need to reevaluate their primary objective for existence.

The purpose of a Board of Pharmacy is to do everything within its scope and power to protect the public within the board sphere of pharmacy. Unquestionably many board members have carried out this responsibility. On the other hand, there is no doubt that some members have promulgated the special interests of pharmacy more diligently than they have promulgated the avowed purpose of the board. By promulgate I mean not necessarily through acts of commission but also through acts of omission, that is, by their inaction in letting various detrimental practices develop, continue and expand. Thus, an important aspect of the survival of pharmacy as a profession lies to a degree on the proper motivation of board members in the discharge of their public duties entrusted to them by the public.

If there are any neutral segments of the profession, educators are probably on top of the list. They have pursued special interests but these have been toward promoting their colleges in order to obtain a larger number and higher calibre of students because they are in a competitive market. Their goal or purpose (to reduce it to simple terms) is to provide well trained graduates to pursue a meaningful and responsible career to promote the public health through pharmacy. Their interests are directed toward this goal. That they are trying to fulfill their goal is unquestioned. That they are providing this type of graduate however is questioned by many. Let's explore this point further. If colleges are not graduating the type of pharmacist we as practitioners would like to have, then what are some of the underlying causes?

Colleges of pharmacy can only attract a level of student as high or as low as the image, the challenge, the prestige, the contribution, the satisfaction that pharmacy as an occupation imbues in the public mind—indeed in the mind of the young high school scholar who is looking forward to higher education and who is exploring the vast opportunities available to him in deciding his future place in the sun. Pharmacy, as a vocational pursuit in the mind of the high school graduate lies in his image of that phase of pharmacy with which he is most familiar—retail pharmacy. Until retail pharmacy as it is so often practiced today improves its professional posture it will continue to be difficult to attract students of a high calibre and professional motivation into our colleges of pharmacy. Thus, a major challenge to professional survival rests with the responsibility of the many outstanding retail practitioners to help elevate the standards of practice in the less desirable pharmacies or to assist in their demise.

The pharmaceutical industry is considered a segment of the profession. Its purpose is to provide the best drugs available to help cure and alleviate the sick and injured. Unquestionably, it has done much to fulfill its responsibilities within this context. Because it must be concerned with the stockholder's desires, industry has had to engage in special interests also. The competitive nature of our free enterprise system has placed significant pressure on the ethical pharmaceutical industry to bring into sharper focus the fulfillment of these special interests. It has been pursued to the point, however, where many believe that these special interests have a foot in the door so-to-speak and the question is being raised as to whether the pharmaceutical industry's prime objective is interest over purpose. As long as industry maintains purpose (within the context of improving the public health) as its primary objective over and above interest (within the stockholder's economic desires) it shall then be in a most favorable position in maintaining its autonomy from complete governmental control. If on the other hand, interest continues to make headway over purpose as some have a tendency to think the trend is going, then this vital segment of pharmacy as a free enterprise industry will have a most difficult challenge in the years ahead in maintaining its independent professional posture.

Some pharmaceutical organizations have done much to assist in elevating standards of practice and to emphasize in pharmacists' minds the basic philosophy of purpose over interest. Unfortunately, organizations with such an altruistic objective have received little support from practitioners. On the other hand, many pharmaceutical organizations have the avowed purpose of promoting the economic interest of pharmacists as their primary objective.

This presents a most serious threat to the survival of pharmacy as a profession. Thus, another major challenge to professional survival is for all practitioners to support our national professional organization—the A.Ph.A.—and to reevaluate the objectives of many state and local associations in order to bring about an improvement in their philosophy toward the basic purpose for the existence of pharmacy.

Of all the major challenges to professional survival however, the most formidable one still remains with hospital pharmacy. Hospital pharmacists have accepted their challenge. We need the support of all the segments of pharmacy and invite them to accept their challenge in this era of professional survival.

experiences with FUMED SILICON DIOXIDE as a suspending agent

by JOSEPH H. BECKERMAN
and GERALD E. SCHUMACHER

► SEARCH FOR AN IDEAL SUSPENDING AGENT HAS BEEN endless, complicated by ionic incompatibilities, *p*H instabilities, and personal preferences. Recently a fumed silicon dioxide, commercially available as Cab-O-Sil*, has been investigated.

Cab-O-Sil is described[1] as a submicroscopic, amorphous silica obtained by vapor phase hydrolysis in a hot, gaseous environment (1100° C.) yielding a particle size of 15 mu and a surface area in excess of 175 sq. meters/Gm. Gravimetric analysis of the product shows a silicon dioxide purity above 99 percent, a combined ferric and aluminum oxides content of 0.01 percent, and no trace of calcium or magnesium oxides. A concentration of 4 percent in aqueous dispersion produces a *p*H of 4 to 5. The refractive index of 1.55 imparts to most transparent solutions an effect of translucense. The product resembles a refined snow.

Observation of the above data invites some predictions concerning the nature of the colloidal silica such as rapid dispersion, good suspending properties, and adsorbing capabilities.

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*Godfrey L. Cabot, Inc., Boston 10, Massachusetts.

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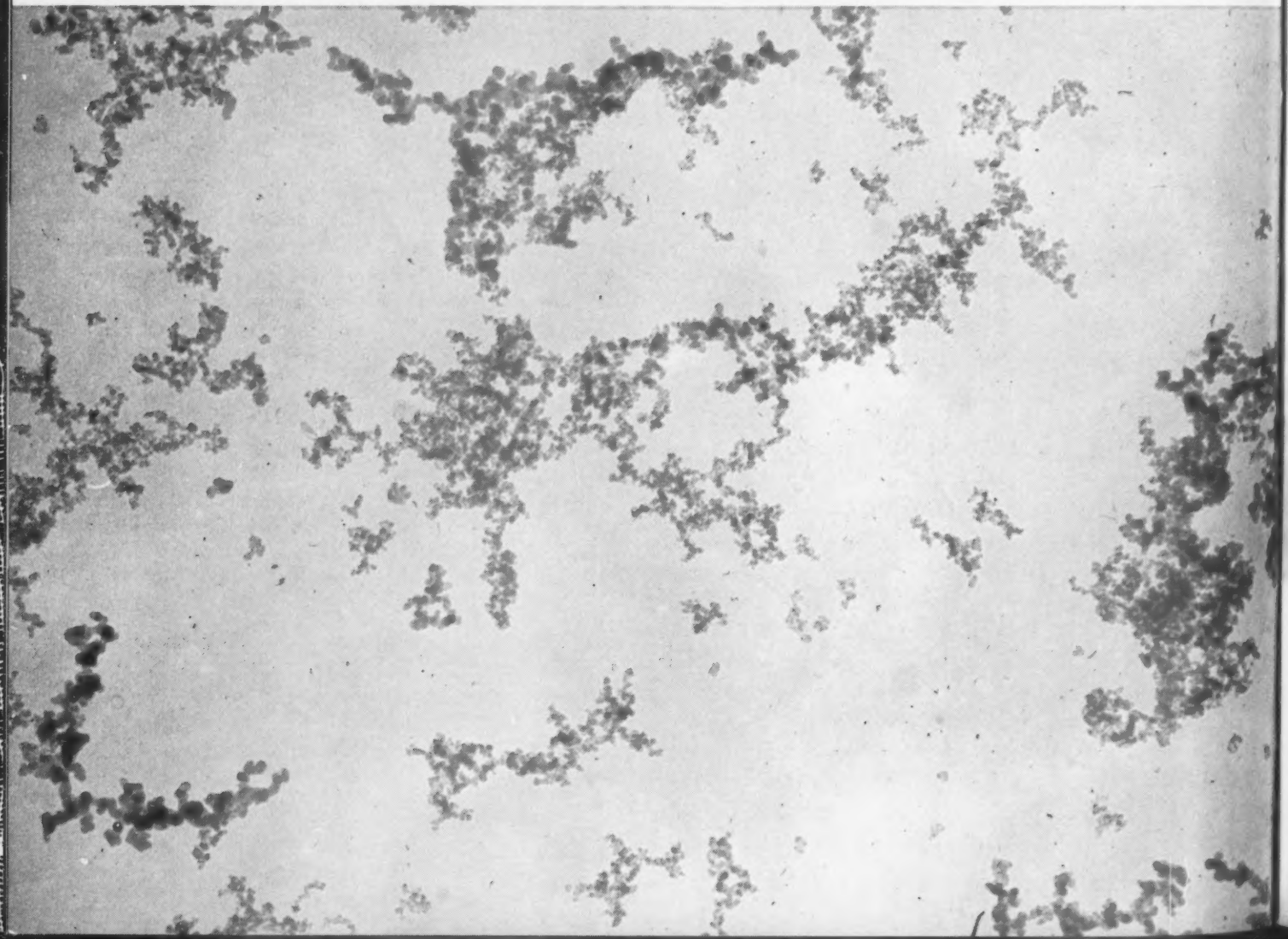

Cab-O-Sil is recommended for a variety of uses wherein suspending, thickening, adsorbing, and reinforcing are desired. To date we have concerned ourselves with only the suspending properties of this agent.

Procedures

The suspending properties of Cab-O-Sil were observed in acidic and basic vehicles; in addition, the physical characteristics of dispersion, thixotropy, and redispersion were noted. As silicon dioxide is an integral structural component of two popular suspending agents, bentonite and Veegum**, suspensions incorporating these agents were employed as comparisons.

To test the suspending ability, calamine lotion, a proverbial pharmaceutical problem, was used as a vehicle. Further tests were performed after acidifying the lotion to *p*H 6 by washing the separated lime water layer with dilute acetic acid. Next the suspending properties of Cab-O-Sil in calamine lotion and in distilled water of varying *p*H were noted. Lastly, the viscosity of various aqueous dispersions were grossly observed with reference to *p*H and time.

The incorporation of suspending material was performed with mortar and pestle, [2] the agent added at once to a small portion of vehicle, triturated, and brought to proper volume. The mixture was then placed into uniform graduated sedimentation tubes. The degree of settling was observed over a thirty-day period. During this interval various examinations of thixotropy and redispersion were performed with concomitant mixtures placed within four-ounce prescription bottles, more closely duplicating dispensing conditions. Initially, incorporation of suspending material was aided by an electric mixer*** but this procedure was eliminated and will be discussed later.

Results

The relationships of three suspending agents with reference to the degree of separation with time are depicted in Figures 1 through 6. At concentrations of 1.25 Gm./100 ml. (Figures 1, 2) and 3.0 Gm./100 ml. (Figures 3, 4), Cab-O-Sil retained more material in suspension than Veegum or bentonite (a bentonite concentration of 1.25 Gm./100 ml. represents the USP preparation): respectively, 18 percent, 22 percent, 25 percent, and 15 percent. Figures 5 and 6 summarize these relationships.

Tests performed with acidified calamine lotion (*p*H 6) produced results comparable to those indicated in Figures 1 through 6.

The suspending capacity of Cab-O-Sil at varying *p*H

**R. T. Vanderbilt Co. Inc., 230 Park Ave., N.Y. 17, N.Y.

***Robbins and Myers, Inc., Springfield, Ohio.

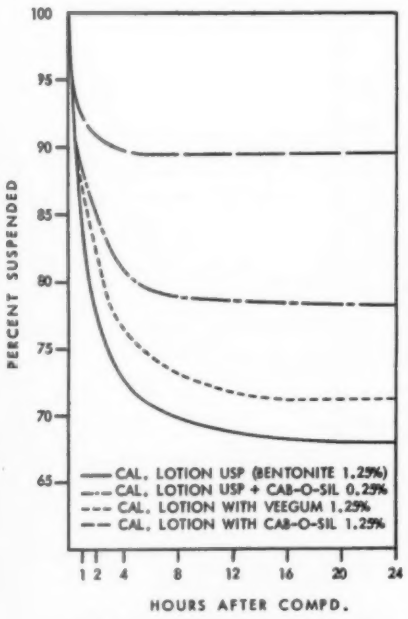

FIGURE 1 THE COMPARATIVE SUSPENDING CAPACITY IN CALAMINE LOTION OF THREE AGENTS AT THE USP CONCENTRATION.

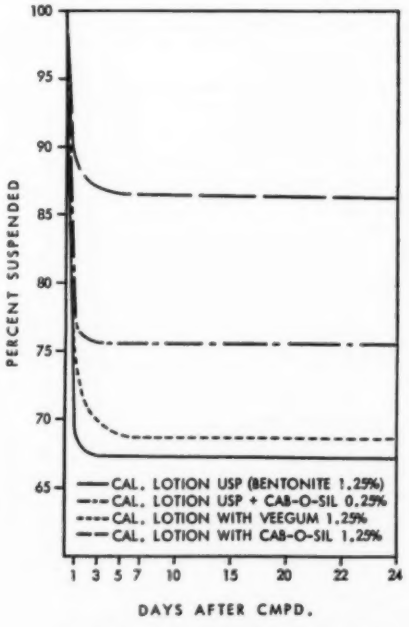

FIGURE 2 THE COMPARATIVE SUSPENDING CAPACITY IN CALAMINE LOTION OF THREE AGENTS AT THE USP CONCENTRATION.

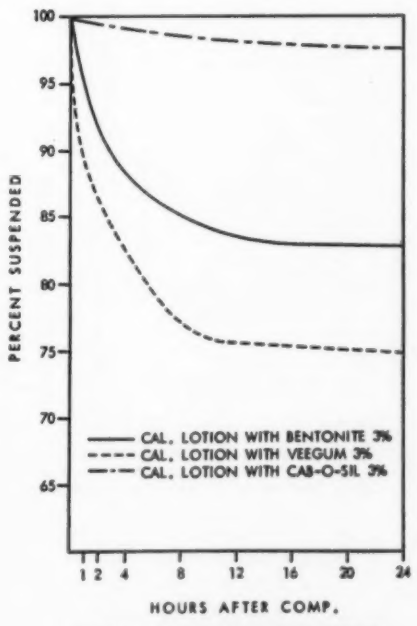

FIGURE 3 THE COMPARATIVE SUSPENDING CAPACITY IN CALAMINE LOTION OF THREE AGENTS AT A CONCENTRATION OF 3%.

is shown in Figures 7 and 8. In Figure 7 the data is not valid below a *p*H of 5.5 due to a change in the nature of calamine; zinc oxide is converted to the more soluble salt.

A point of interest not graphed in Figure 7 is the comparative suspending capacity of the three agents at their respective points of minimum suspending ability. Cab-O-Sil retained 12 percent and 15 percent more suspended material than Veegum and bentonite.

Experiments which produced no significant changes in data were not graphed. These consisted of (1) Cab-O-Sil viscosity relationships with *p*H and time and (2) the buffer capacity of a combination of Cab-O-Sil in calamine suspension. In (1), viscosity remained relatively stable at varying *p*H except for a thinning effect near the point of minimum suspending ability shown in Figure 8. Viscosity did not increase significantly with time at concentrations of 0.75 Gm./100 ml. through 8.0 Gm./100 ml. In (2), the incorporation of Cab-O-Sil into calamine suspension showed no buffer capacity.

Discussion

The practical application of Cab-O-Sil for the dispensing pharmacist was a major consideration in all the experiments performed. To accomplish this end the materials were triturated with the vehicle directly. This places bentonite and Veegum at an immediate disadvantage for they exert their optimal effect when prepared as a magma or as slowly incorporated flakes, respectively.[3,4] Yet these are not unfair conditions within the framework of judgment stipulated.

One of the basic advantages of Cab-O-Sil is the faster rate with which it was incorporated into suspensions as compared with bentonite and Veegum. Throughout the examination period Cab-O-Sil suspensions appeared more elegant than those of bentonite and considerably more so than those of Veegum.

But the prime advantage of Cab-O-Sil is a superior ability to stabilize suspensions. The manufacturer's literature points out that the addition of only 0.25 Gm./100 ml. of Cab-O-Sil[1] to an *existing* suspension enhances its stability (Figures 1,2 emphasize this); but this is a questionable advantage pharmaceutically. Such a procedure compounds the issue, necessitating the inclusion of two suspending agents into a vehicle.

Examination of Figures 1 through 4 shows the relative ability of the three agents to stabilize a calamine suspension. Cab-O-Sil in a concentration equivalent to the USP preparation improved the stability of the suspension by 18 percent over one of Veegum and 22 percent over one of bentonite. From a dispensing standpoint this corresponds to 180 ml. and 220 ml. more suspended material per liter, respectively (Figures 1,2). A concentration of 3.0 Gm./100 ml. of Cab-O-Sil was superior to bentonite by 15 percent and Veegum by 25 percent (Figures 3,4). At the previous concentration of 1.25 Gm./100 ml., Cab-O-Sil retained more suspended material than either bentonite or Veegum at a concentration of 3.0 Gm./100 ml.

That, at the latter concentration, bentonite was superior to Veegum in suspending ability is contrary to the findings of most investigators.[2,5,6] This may possi-

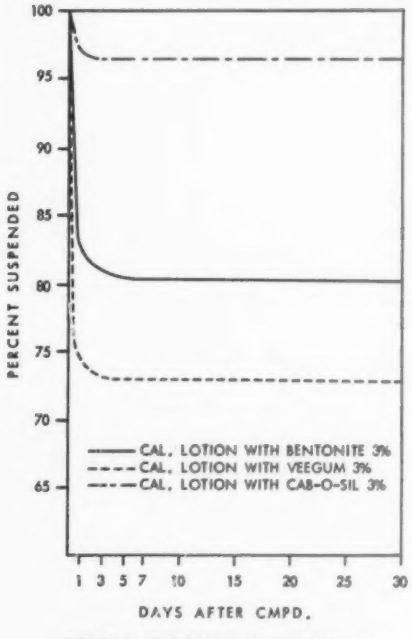

FIGURE 4 THE COMPARATIVE SUSPENDING CAPACITY IN CALAMINE LOTION OF THREE AGENTS AT A CONCENTRATION OF 3%.

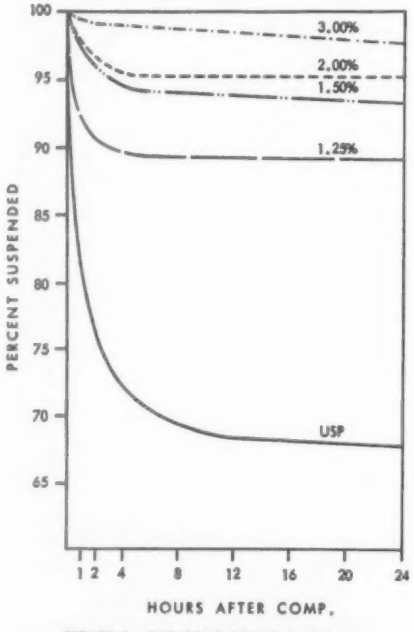

FIGURE 5 THE COMPARATIVE SUSPENDING CAPACITY IN CALAMINE LOTION OF CAB-O-SIL AT VARYING CONCENTRATIONS.

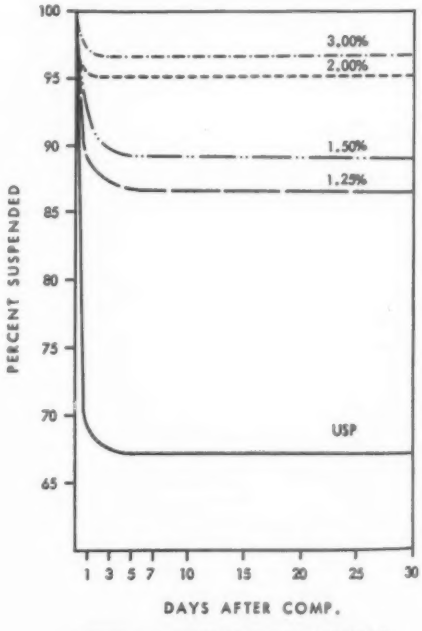

FIGURE 6 THE COMPARATIVE SUSPENDING CAPACITY IN CALAMINE LOTION OF CAB-O-SIL AT VARYING CONCENTRATIONS.

bly be explained on the basis of the incorporation techniques as detailed above.

The relative increase in the suspending ability of Cab-O-Sil above concentrations of 1.5 Gm./100 ml. was not significant as indicated in Figures 5 and 6. The addition of 1.25 Gm./100 ml., which we considered optimal, produced a fine lotion which redispersed readily. Above this concentration the suspension began to lose the characteristics of the lotion form and resembled a soft mucilage when increased to 3.0 Gm./100 ml.

Initially, an electric mixer was utilized in the preparation of the suspensions. This was rapidly discarded. The concomitant inclusion of air and reduction in particle size made for an unpourable mass above concentrations of 1.5 Gm./100 ml.

Observation of the thixotropic and redispersive characteristics of Cab-O-Sil, bentonite, and Veegum failed to point up conclusive differences; all dispersed rapidly upon agitation. Viscosity was not a differentiating factor.

Cab-O-Sil is not without certain disadvantages. Figures 7 and 8 elucidate its varying applicability throughout the latitude of the *p*H range. An alkaline media was most favorable but increasing acidity did not destroy the suspending properties. In general there was a correlation between *p*H and suspending capacity.

Cab-O-Sil in water appeared inferior to bentonite and Veegum in the ability to redisperse. Moderate agitation produced a "flaking" effect. To achieve a uniform redistribution vigorous shaking was required.

The extreme fineness of the product required a much greater volume of material than bentonite or Veegum on a weight basis. The colloidal particle size lends itself all too readily to diffusion through the air. Silicosis is therefore a possibility. However, research in this area has discounted the probability of silicosis resulting from an amorphous silica[7].

Summary

The properties of a new suspending agent have been tested. Favorable preliminary results show that the color, the ease of dispersion, and the suspending capacity of fumed silicon dioxide, available as Cab-O-Sil, warrants further pharmaceutical investigation.

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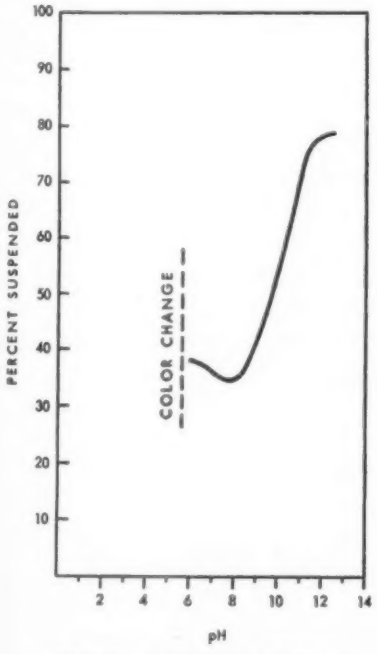

FIGURE 7 RELATIONSHIP OF pH TO THE PERCENTAGE OF CALAMINE LOTION SUSPENDED WITH CAB-O-SIL 1.25%.

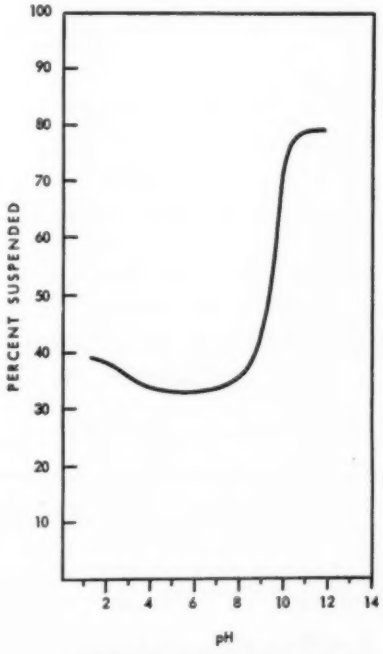

FIGURE 8 RELATIONSHIP OF pH TO PERCENTAGE OF CAB-O-SIL 1.25% SUSPENDED IN AQUEOUS MEDIUM.

THE PROBLEM OF WHAT TO CHARGE for drugs dispensed is of acute concern both to hospital administrators and hospital pharmacists. Suggesting that possibly the main reason drug pricing in hospitals has become such a problem is that too many hospital pharmacists have been practicing only "pharmacy in hospitals" instead of practicing "hospital pharmacy," this paper proceeds to discuss drug pricing from the standpoint of its importance to the hospital administrator and the hospital pharmacist.

In emphasizing the importance of this problem to the hospital administrator, the statement is quoted that "hospital rates should be arrived at by the logical process of first making detailed studies of all cost involved." Assuming agreement on this principle, there are enumerated four important problems the administrator faces that can be attacked by cost analysis in the hospital and in the pharmacy in particular: (1) bad publicity concerning charges in hospitals, (2) controlling rising costs, (3) discounts to employees, staff and board members, (4) the unfairness to hospitals of some hospitalization insurance plans. The relation of each of these problems to drug pricing in hospitals is discussed.

Under the heading "Importance to the Hospital Pharmacist," considerable attention is given to the following topics: (1) "loaded" drug charges, (2) charges of "unethical" pricing in the hospital pharmacy, (3) giving credit for returned drugs, (4) fighting rising drug costs to the patient.

Results of a statewide exploratory survey on pricing schedules in hospital pharmacies are reported. These results form the basis for a hypothetical solution and method of attack for the hospital drug pricing problem. The development of what the authors term a "do-it-yourself pricing schedule kit" is shown. In essence, the solution offered is a schedule based on identical costs in each dispensing department with any other unusual costs, plus profits, left to each hospital pharmacist to be handled on an individual basis.

A step by step procedure for conducting a departmental cost analysis is presented wherein terms are defined and methods are suggested for obtaining the various cost items. Application of the cost analysis to construction of a pricing schedule is described.

The concluding portion of this paper reports on three months of operation under the proposed pricing system and on the problems encountered in the actual cost accounting of a teaching hospital pharmacy.

A COST ACCOUNTING SYSTEM & PRICING SCHEDULE FOR HOSPITAL PHARMACY

by KENNETH N. BARKER *and* WARREN E. MCCONNELL

► NOT VERY LONG AGO, this statement by the editor of a leading hospital journal preceded an article on drug charges. "Number one among the problems that beset small hospitals is the thorny question of what to charge for drugs dispensed. The lack of uniformity has aroused criticism of current practices and instilled concern in some administrators about the future."[1]

Now, six years later, the "future" of the above statement is upon us and the "criticism of current practices" is loud enough to concern many hospital administrators. Along with hospital administrators, those hospital pharmacists who have helped distinguish the practice of "hospital pharmacy" from the practice of "pharmacy in hospitals" are also concerned about this problem. And well they should be. Possible the main reason that pricing drugs in hospitals has become such a problem is that too many hospital pharmacists have been practicing only "pharmacy in hospitals." Instead of integrating the pharmacy into the hospital business structure, they have tried to apply the rules of pricing used in *retail* pharmacy to the pricing of drugs in hospitals. Is this the only solution to the problem? It may be to some administrators who, for lack of a hospital pharmacist, are glad to get any kind of an organized pricing system. With the present shortage of hospital pharmacists this is understandable. But the administrator who has hired and supported a true "hospital pharmacist" deserves a better answer. This paper was written to help the hospital pharmacist supply that answer.

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Importance to the Administrator

Why is the problem of a hospital pharmacy pricing system important to the administrator? Because, as a by-product of the extensive cost analysis required, an

accurate system of relating prices to costs can help solve some of his major problems.

The fact that hospital rates should be related to costs has been emphasized by the American Hospital Association House of Delegates. In recommending principles for establishing rates for hospital service, they stated that "established rates to self-paying patients for similar services and accommodations should be based upon, and reasonably related to, the full cost."[2] In the full cost they included operating costs and capital depreciation.

According to MacEachern, "hospital rates should be arrived at by the logical process of first making detailed studies of all costs involved. The increasing emphasis upon cost as the basic element in rates has led to the importance currently attached to cost accounting."[3] With this principle agreed upon, there are four important problems of the administrator that can be attacked by cost analysis in the hospital *and in the pharmacy in particular*. These are the problems of: (1) bad publicity concerning charges in hospitals, (2) controlling rising costs, (3) discounts to employees, staff, and board members, and (4) the unfairness of some health insurance plans to hospitals.

Bad Publicity About Drug Charges. Administrators are having to explain charges to a public already disturbed by the high cost of drugs.[4] This, of course, reads like an understatement to those who have followed the recent governmental inquiry into the high price of drugs. The obvious question to the thinking administrator is, "Is retail pharmacy next? And after that, (or along with it), the price of drugs in hospitals?" Already, one senator in our state has suggested an inquiry into the price of drugs in retail stores. Administrators, of course, realize the importance of good public relations. The president of the South Carolina Hospital Association has said, "Certain concessions by government are made, benefits such as volunteer services and philanthropic gifts accrue to hospitals because they are operated not for profit. This is the biggest single aspect of hospital operations accounting for their good will and esteem."[5] It should be added here that this "good will and esteem" in turn *gives* the hospital the support it needs to operate "not for profit" (without losing money). The administrator knows best of all how this good will and esteem would suffer had the following article, appearing in the *American Druggist*, made headlines in the nation's newspapers:

Hits Huge Markups By Private Hospitals

Amazing markups are being charged by private New York state hospitals, charged State Attorney-General Nathaniel Goldstein. He declared that a number of private hospitals are run by men, 'Who, in the pursuit of the greatest possible profit, have taken advantage of loopholes in the law to the distress of helpless men and women.' The attorney-general told how hospitals sold $9.63 worth of aspirin for $600.00, 32c worth of penicillin for $6.00, and 32c worth of antibiotics for $9.00. In his report he recommended that the New York legislature pass a law to establish a state licensing system for private hospitals.[6]

Administrators, being also concerned with maintaining good professional relations, were undoubtly unhappy when the following article appeared in the *Journal of the American Medical Association*:

Exorbitant Charges For Drugs

The Council has been informed . . . that some pharmacists have made this . . . (the high price of antibiotics) . . . a pretext for raising the price of less expensive drugs, pretending that these were also 'expensive,' and that some hospitals have been known to make exorbitant charges to patients able to pay, as a hidden means of financing the deficits with which most hospitals are all too familiar. . . These people should ask themselves this question: 'Are not exorbitant profits a hold-up of the unfortunate and generally helpless victim? Is it not fraud to suggest that high prices are due to the cost of the drug when this is not wholly true?'[7]

We know, as do most people in the health field, the true story behind the rising costs in the hospital and in the pharmaceutical fields. It has been pointed out that hospital charges rose 161 percent compared to a 49 percent rise in commodity prices over a 10 year period, a difference which all of us as taxpayers want and deserve to have explained.[8]

What is the answer to the problem of "bad publicity" and "loss of goodwill" over hospital rates? MacEachern says, "*Public education* as applied to hospitals may be defined as a cooperative plan of utilizing every possible legitimate and ethical means of informing the public of the benefits it can expect to derive from its hospitals, so that with an understanding and appreciation of the service of the institution to humanity, the public may foster an attitude of genuine goodwill towards its hospitals."[3] This answer is elementary to the administrator but implementing it is a large and continuous task. Pharmacists have made some noteworthy strides in this respect as regards their profession. I refer to such excellent aids for hospital pharmacists as "Medications and Their True Worth" by Zugich.[9] An explanation I particularly like is the comparison of the average prescription price in terms of working time at prevailing wages over a 30 year period. It took 1 hour and 31 minutes in working time in 1929 to pay for the average prescription. In 1958 it took 1 hour and 26 minutes of working time to pay for the average prescription, and the results were probably much better.[10]

This is how some pharmacists have attacked their part of the problem. Now, what have administrators recommended and done? The president of a state hospital association writes:

Needed: Honest Charges Honestly Explained

The man in the street will agree that expenses rightfully include depreciation, bad debts, etc. as in any other business. Do they *really* represent costs? They do when lumped together in 'average income per patient day', but this isn't good enough, because the components of the total patients

bill are not an accumulation of non-profit department charges only, but are also excessive charges for certain departments such as pharmacy and laboratory which in turn offset losses from subsidized nonrevenue producing departments. Changes must be made for these reasons, besides fairness to the patient:

1. The public is better educated, and asking embarrassing questions.
2. Unions, governmental agencies, commercial insurance companies, and voluntary prepayment plans are insistent that charges be itemized. Excess charges stand out and cannot be easily explained to patient or third party.
3. Charges in excessive create doubt about the accuracy of the bill, the management, and hospitals in general. Hospitals must adjust their fee system and then initiate a public education program before the public forces such a move. Honest charges can be defended logically on a business-like basis and are best in the long run, so it seems to me.[5]

The same basic answer was given at an institute on hospital costs: "A hospital is simply the congregated personnel and equipment that the community has provided for its medical care; therefore, the community has a right to ask questions about the hospital and has a right to expect that we will give them understanding answers." The author adds later on: "To be effective [in convincing the public about hospital costs] we have to feel secure about what we are saying; we must know the basic answers to the questions about hospital costs." The name of the presentation was, "Let"s Give the Public the Facts about Costs."[11]

Now, how does a pricing schedule help supply this need for "Honest Charges, Honestly Explained?" It supplies and explains the basic answers about pharmacy costs disclosed by the cost accounting required to use a pricing schedule correctly. After the hospital pharmacist has supplied—and continues to supply—accurate data concerning the true identity and amounts of the components of the prices he charges for drugs, he can then rest assured that he has done his duty to his administrator in the solution of this problem. Regardless of the use made of this data, the hospital pharmacist will have done everything in his power to supply to his administrator the basis for an honest explanation that will stand the public scrutiny.

Controlling Rising Costs. The Journal of the American Medical Association, in an article on exorbitant charges for drugs, states, "One can't object . . . [to high but reasonable prices] . . . including a reasonable service charge. But prices add such a burden to sickness, they must be kept as low as possible."[7] The second reason why administrators are interested in pricing systems in the hospital pharmacy is that they are concerned not only with *explaining* the high cost of medical care to the public but also *doing something* about it. How can a pricing schedule help here?

The *Handbook of Accounting, Statistics, and Business Office Procedure for Hospitals* mentions that statistical reports of hospital activity (both professional and nonprofessional) may be employed to advantage by hospital management in a number of ways.[12] Among these are listed:

1. To provide a basis for preparing operation budgets.

2. To provide a basis for the distribution of expenses when computing cost of operations.

3. To provide a basis for the calculation of average income and costs per unit of service rendered.

Another author has called for uniform accounting and statistics in hospitals ". . . to appraise the results of varying methods and practices within the institutions, and to compare the experience with those of the other institutions. This information would increase services *at least 5 percent in hospitals!*" (author's italics)

As stated previously, a good pricing schedule requires good cost accounting. The pharmacist can perform a real service to his administrator by supplying not only good accounting records from his department, but records comparable to those of other institutions. How this can be accomplished in the development of a pricing schedule will be explained in detail later.

Discounts to Employees. The third problem is that of discounts to employees and staff. Although this is a minor problem compared with public relations and cost control, it is a bothersome one that requires tact and diplomacy. According to a leading hospital journal, "the practice is still widespread, but not universally the case as [it] was a while back. Remember, the discounted bill must be paid by someone. Certainly people will not be happy about paying [for drugs] for doctors and trustees who can well afford to pay for their own care."[14]

Using an accurate pricing schedule in the pharmacy means that the administrator can easily show the true cost of medications to anyone who thinks he is entitled to a discount, and that person should soon "catch on" that what he is actually asking for is to have someone else pay part of his drug expense. His pride should then prevent him from taking "charity" of this sort.

Unfairness of Most Health Insurance Plans. The fourth problem is that of the unfairness to hospitals of some health insurance programs. The Blue Cross policy, for instance, will pay cost or published charges, whichever is lower. In determining the rate of reimbursement to the individual hospital the cost of teaching, research and capital expenditure are usually excluded. Therefore, Blue Cross actually pays at a discount, or pays less than the cost of rendering the service. This makes those patients without commercial or Blue Cross insurance pay a higher portion of the cost than Blue Cross.[15]

The answer to this problem lies in a public education program supported by the facts disclosed by an accurate cost analysis, a necessary prerequisite in the compilation of a pricing schedule for the hospital pharmacy. If the cost picture is explained simply and

on the basis of carefully backed-up facts, much might be done to solve this problem also.

Importance to the Hospital Pharmacist

Why is the problem of a pharmacy pricing system important to the hospital pharmacist? Naturally, part of the answer is that we have seen what such a system can do for the administrator—and part of the pharmacist's duty is to serve his administrator. But there are certain problems related primarily to the pharmacy itself that the administrator relies on the pharmacist to solve. There are other problems related to the pharmacist's professional obligations which may urgently require much of his time and effort.

"Loaded" Drug Charges. One problem that concerns primarily the pharmacist, both in his duty to the administrator and his profession, is the problem of "loaded" drug charges. True, this is also a problem of the administrator—and not a small one at that—but there are certain aspects of it that deeply concern the career hospital pharmacist. Pharmacy itself is now being attacked because of its allegedly "exorbitant" profits. The call throughout the profession is for public education by every member to combat the bad publicity. The career hospital pharmacist knows that the subject of drug prices in hospitals is a sore point with the public that reflects upon pharmacy as well as the hospital itself, but his position on this subject is a difficult one. He may prepare and support public education information and be commended for his efforts but he is aware of two underlying facts about the problem that take some of the "heart" out of his work: (1) He knows that though the over-all patient's bill is fair enough, the drug charges are in many cases unreasonable and not based on cost, and (2) In many cases there is apparently not very much he can do about it.

What are "loaded" drug charges and where did they come from? Rate structures at the turn of the century were roughly comparable to those of a hotel. When the first medical advances started appearing (separating a hospital from a hotel for the ill) such as surgery, X-ray, laboratory analysis, etc., the charges were made on the same basis that private medicine used, that is, what they thought patients would be willing to pay. Since then, the average length of patient stay has continually decreased while the services required and provided have increased, resulting in a higher patient-day cost. As the need for nursing care climbed, hospitals hired nurses to cut the cost of private nurses for patients, but *no additional charge* was made. The cost was simply added to the already overburdened daily rate, which, of course, soon could no longer carry the burden. To solve the problem, hospitals began charging for extra service at rates which would offset deficits in other departments, notably nursing.[16]

This system was used traditionally because it seemed more acceptable to the public. Patients could evaluate their room charge by hotel comparison but were uninformed about pharmacy, X-ray and laboratory costs. It was justified by saying that total charges equaled total expenses only, and that hospital finance was too difficult for the average citizen anyway.[5]

What is the status of this problem now? One hospital journal reports that a recent survey released by the Hospital Council of Philadelphia showed the trend toward a higher markup on ancillary services to compensate for loss on room, board, and nursing care has been revised by the majority of hospitals. In other words, the pattern is changing to one in which the charges are more closely related to the costs.[17] Obviously, progress is being made in this area.

The solution suggested for this problem has run something like this: It is agreed that the rate change must come gradually; then:

1. As over-all costs climb, rates might be increased sufficiently in all deficit units to match increased costs in these units, while holding back on "profit-making" units.
2. The cost of nursing and professional services should be separated. Daily rates should include "hotel" expenses only.

This then becomes a package that the public can understand and compare with hotel rates. It can put nursing service into a revenue producing category. This would eliminate much misunderstanding and explanation that goes with justifying hospital rates to the patient. Through brochure explanation, patients would generally understand and accept flat per diem nursing and professional charges.[16] It is interesting to note here that when this solution was applied in theory to a large university hospital, a reduction in pharmacy rates of 30 percent was effected.

The words of another administrator supply us with a method by which the hospital pharmacist may attack this problem: "If any radical drug price cutting can be effected in hospitals, an overall cost accounting job would have to be done in most hospitals."[4] In this case the hospital pharmacist can *aid* his administrator by leading him, if necessary, and be responsible for helping to solve a problem that is vital to his own profession. It can be done, of course, using the facts collected in compiling a pricing schedule.

First, the pharmacist should consult the administrator to find out if he is aware of the importance of this problem and what his plans are for attacking it. Most pharmacists will find the administrator knows more about this problem than he himself does. However, by offering to do some cost accounting for the administrator to help him educate the board and the public in this matter, the pharmacist will be recognized as an alert and competent executive.

There will be some hospitals where the problem of loaded drug charges has been overlooked, or underrated, or just ignored. Here the pharmacist might try the following suggestion. First, ask the administrator if he objects to your doing a cost accounting study in the pharmacy. This may seem superfluous but his approval and support (few administrators like to be thought of as "against" cost accounting) will make him feel obligated at least to review the results critically, if not act upon them. After you have completed your cost analysis and put together your pricing schedule, select a representative number of prescriptions covering a certain period of time (e.g., one month) and tabulate the amounts of each and every cost and expense that went into each individual prescription. Next, compare the total cost of dispensing each prescription with the selling price of the prescription in your hospital. (The correct procedure for carrying out this operation will be shown later.) Submit the report to your administrator as part of a continuing survey and let him see exactly how much money the "carried services" (nursing, etc.) add to the cost of each prescription. What you will be doing is actually a "private educational program" for the benefit of the administrator. (If the results of this "campaign" are disappointing, you can at least rest assured that you have done everything within your power to serve your profession and hospital along these lines.)

It is noted that in many cases hospital pharmacists "inherit" along with their position a pricing system which the administrator is sometimes reluctant to change. A report similar to the one described above will quickly point out those cases wherein price has little or no relation to cost. When the administrator observes that a $3.00 charge for pencillin includes no more than its correct allocation of nursing administration cost, etc., the discrepancies in drug charges will be too obvious to hide behind such a statement as, "Well, that includes a lot of costs like injection time, depreciation, and things like that!"

Actually most administrators will admire your business ability and appreciate your help in this problem.

Charges of "Unethical Pricing." The second problem that makes a pricing schedule important to the hospital pharmacist is the concept held by some, both in the pharmacy profession itself and also in related fields, that the hospital pharmacy is really only a "pharmacy in a hospital" and the economic basis of running a hospital pharmacy is no different than any other pharmacy. These people cannot understand why hospital pharmacy prices should be any different than the current retail prices. Indeed, some even accuse hospital pharmacists of "unethical" practices should their prices differ from those in the retail field.

The biggest difference between hospital and retail pharmacy is, of course, the reason for the very existence of the two. An assistant administrator has stated it in these terms: "The corner drugstore exists to sell a product and the rendering of service is incidental thereto; the hospital exists to render service and the sale of a product is incidental thereto."[19] The hospital is operated on a non-profit basis in most instances, in direct contrast to the retail pharmacy.

The retail pharmacy has only an obligation to supply to the public the minimum level of professional service at any price the market will bear. By this it is *not* meant that pharmacy does not have dedicated professional pharmacists in the retail field, or that they are a small minority. According to Dr. William S. Apple, "the profession of pharmacy has been entrusted a legal monopoly which carries an unwritten mandatory requisite that the principles of 'buyer beware,' and 'take what the traffic will bear,' be excluded from the pharmacist's pricing policy."[18] But Dr. Apple was talking about the "professional" aspects of pharmacy and these many times conflict to varying degrees with the "business" aspects of pharmacy.[20]

This balance between two often opposing forces seems to me to be unbalanced more of the time in the direction of the business aspects in the retail field. This may very likely be a natural result of the retail pharmacist benefiting *directly* from his business efforts in terms of more take-home pay. The hospital pharmacist, in almost all cases is a salaried employee, therefore his remuneration depends upon the quality of the service he renders; the number or dollar value of drugs he handles is secondary in the eyes of his employer.

To go into some more tangible differences, the hospital pharmacy differs from the private business in that substantially more price inelasticity is characteristic in the hospital pharmacy than in the retail store. The hospital cannot create a greater volume of business by merely lowering its prices. True, the *demand* factor for both retail pharmacy and hospital pharmacy is inelastic, since the total units of goods and services bought by the general public from both cannot be increased by lowering all prices; however, in a slack season, the retail pharmacist is better able to cut costs below those of his competitors and then lower his prices to increase his *share* of the market. This ability is due to the smaller proportion of fixed costs involved in retail pharmacy, compared to the hospital pharmacy. For example, labor becomes a fixed cost in hospital pharmacy to a great extent, because as long as there are patients in the hospital, the pharmacy must keep regular hours. Also, special equipment for compounding special drug forms used in the hospital adds a large dollar value to the fixed cost total.

Two other characteristics of hospitals in particular contribute to price inelasticity. These are: (1) lack of competing hospitals, and (2) patient's physician has staff privileges at only one or two hospitals.

The effect of price inelasticity forces the hospital

to use a more standardized cost in charging patients in order to insure the proper return without loss to the hospital. (This argument has been advanced in support of the use of inclusive rates.) It is now generally concluded that it is uneconomical to run a hospital below 60 percent occupancy; however, in off seasons many hospitals drop below this point. Until it becomes possible to develop a better mechanism to determine individual costs, the *average cost* as a basis for pricing will probably continue to be utilized in all hospitals to prevent losses due to fluctuations of the demand to which their pricing system cannot adjust.[24]

Now it has been pointed out that the price inelasticity problem is harder to solve in hospital pharmacy, that hospital pharmacies sell primarily service while retail stores sell primarily drugs, and that it is natural to expect each of the two different specialities of the profession to pursue the avenue of the greatest acknowledgment and personal gain. The hospital pharmacist could be considered as an employee of the community while the retail pharmacist represents basically private interests. The pricing schedule illustrated later will also show that many costs in hospital pharmacy have no counterpart in retail pharmacy.

We believe the considerations mentioned above plus the information gathered from a cost analysis of a hospital pharmacy operation can, if well presented, successfully answer those who call hospital pharmacists "unethical" because the prices of drugs in the hospital differ from those in the drugstore. One other thought that might be added on this subject is the fact that the hospital pharmacist is responsible to the retail pharmacist as a taxpayer and therefore has an obligation to promote those ends to which a hospital is dedicated, principally, service to the patient. It should be realized that making the expense as low as sound business practice permits is an important contribution by the hospital pharmacist toward this end.

Giving Credit for Returned Drugs. The third problem that compiling a pricing schedule can help solve is that of drugs returned for credit. In a roundtable discussion reported in *Hospitals,* the question of giving credit for returned drugs was put to three chief pharmacists and five hospital administrators. The words of a chief pharmacist from one of the country's largest medical centers seemed to sum up the opinion on how much the patient should pay for returned drugs. "Credit could only be allowed after the basic cost of issuing a credit has been determined and allocated to each possible credit."[19] Since the cost of processing a prescription must be compiled for a pricing schedule, this figure may then be subtracted from the charge value of returned drugs to receive adequate compensation for the amount that any particular credit operation costs the hospital.

Fighting Rising Drug Prices. The fourth problem of concern to the hospital pharmacist is his professional duty to help hold down the cost of medicine that has become so heavy a burden on the sick. In a study entitled *Modern Prescription Drugs: Their Impact on the Family Budget,* by the Citizens Committee for the Children of New York City, Inc., it was found that one of the most significant factors contributing to the high cost of prescription drugs was the physician's ignorance of the avenues available to him to reduce this cost to his patients. The report said, "The public demands, and physicians too often prescribe, drugs such as antibiotics that are well advertised but not necessarily the treatment of choice in a given situation." Under the heading *Implications for Action,* this committee recommended "an intensified public and professional educational campaign" by those in the health field. Specifically listed were hospitals.[2]

Perhaps one way the hospital pharmacist can help in this situation would be to compile a brochure listing the common classifications by diagnosis of patients entering the hospital. Under each of these types could be listed several regimens with different drugs, plus the daily cost of routine treatment with each of the drugs listed. The details, of course, would have to be worked out with the Pharmacy and Therapeutic Committee or similar representative body of the medical staff. It would have to be made plain that the routines listed were suggestions only and in no way limited the physician in his ordinary prescribing habits. The pricing schedule's value here, of course, would be in explaining to the physician any questions about the prices listed. The brochure could be distributed to the medical staff of the hospital. Even if only few physicians would agree on the proper drug or regimen for any one case, the minimal effect of the brochure would be to make the physician more price conscious in his prescribing habits. The value of this has already been pointed out.

A Pricing Schedule for Hospital Pharmacy

THE SURVEY. In an exploratory survey to gain insight into some of the prevalent attitudes and opinions concerning pricing schedules in hospitals in our state, a questionnaire was sent to 33 hospital pharmacists, all members of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. Twenty-four replies were received with only one reply indicating displeasure at being bothered by "another darn survey." (This party indicated he used no pricing schedule and gave no reason.) The results of the survey showed that only four hospital pharmacies used an established (published and in general use) pricing schedule. Of these four, two used the NARD Schedule, one used the Joe Shine Schedule, and one did not indicate which schedule was used. One hospital pharmacy reported he used the Liggett Schedule for outpatients, while another reported he had compiled his own schedule. The rest of the replies were as follows:

1. Eight pharmacists thought it would be difficult to apply any of the schedules they had seen to their pharmacy (33 percent).
2. Two thought pricing schedules were unfair to the patient or themselves (8 percent).
3. Five replied they were not given the opportunity to recommend the pricing system to be used in their pharmacy

(the administrator or someone else sets this policy) (21 percent).

4. Four believed that all available schedules they had seen were too complicated and time consuming to use (17 percent).

5. Twelve were of the opinion that a pricing schedule might be made to work. but hadn't seen one they liked yet (50 percent).

(The percentages shown total more than 100 percent because some replies listed several reasons.)

More enlightening than the percentage break-down were the comments included on the returned questionnaires:

"I think a fair schedule could be worked out. I am very anxious to find one. I feel a schedule is needed to adjust the various schedules used. This would make a better showing to insurance accountants that check hospital charges for patient claims."

"Hope you come up with a good schedule for hospitals."

"I would dearly love to see a pricing schedule that would allow us to claim maximum insurance benefit and still not be too inconsistent with the cost of the drug being priced."

"I do not believe any known schedule, devised for retail use is adequate for inpatients, as cost of administration, etc., is not taken into consideration."

"The pricing schedules I have seen are not applicable for pricing medications for hospital patients. Also, any pricing schedule would depend to some degree on the type of hospital, whether private, non-profit, or state or county supported."

"Since there are so many variable factors to be considered a schedule can only be useful as a base for a minimum charge."

"Each individual has formed his opinions based on experience, training, and type of thinking. As these are so varied, so are the requirements (of a schedule) to suit each one."

From these replies, several tentative conclusions were drawn: (1) Most hospital pharmacists would like to have a pricing schedule; (2) Many believe, however, that any correlation of pricing schedules between different hospitals would be extremely difficult due to the differences in business structure among hospitals; and (3) Most hospital pharmacists found no solution to the above problem in the pricing schedules now available.

Basic Premises Chosen. The above conclusions suggested at least one possible way to attack the problem. First of all, however, it seemed necessary to set up certain basic premises.

The area of responsibility of the hospital pharmacist concerning drug prices was described in this way. The hospital pharmacist, most of us would agree, is *not* responsible for determining the total return the pharmacy should give back to the hospital. This is an administrative decision.[22] However, once the administration has decided the amount of return desired from the pharmacy, it is often the hospital pharmacist's responsibility to distribute this return among the patients in as equitable a manner as he knows how. Note, we do not say it is necessarily the pharmacist's *right*. Any policy-making decision of this sort always may be superceded by the administration but it seems logical that the administrator should place this responsibility on the shoulders of his hospital pharmacist *if* he is competent to handle it.

Another basic premise chosen was that prices should be related to costs, as has been stated previously. From this it was agreed that any valid schedule relating prices to costs would have to be based on a cost analysis. (From the results of the survey it was concluded that general cost figures in terms of percentages will not suffice and that a cost analysis must be carried out to some extent in *each* institution attempting to use such a schedule.) It should be pointed out here that proponents of the inclusive rate theory of hospital pricing do not believe the relation between departmental costs and prices charged needs correlation except in the total hospital charge to the patient. Because this group represents only 7.4 percent of the hospitals in the United States and is comprised essentially of hospitals of over 500 beds or under 50 beds, no attempt was made to include this charge method in our consideration.[15]

After the above premises had been established, on the basis of the tentative conclusions drawn from our survey and applying some fundamental principles of cost accounting, we arrived at a hypothesis.

Hypothetical Solution and Method of Attack. First, it was conceded that the difference in the quantitative *value* of each cost factor making up the total cost of a drug item to patients in different hospitals was a natural one, arising from the vast difference in hospitals, and therefore could not and should *not* be expected to be the same in different hospitals. However, the *identity* of each factor would be pretty much the same in any hospital pharmacy, with the main differences being the presence or absence of various individual factors. For example, the cost of labor may vary tremendously between hospital pharmacies but every hospital pharmacy has a labor cost. To exploit this similarity for our purposes, it was obvious that hospital pharmacies which have a manufacturing expense could (and should) do a cost analysis of their operation, and then "sell" the manufactured items to the dispensing department. Hospital pharmacies making parenteral solutions could do the same thing, thus eliminating several cost factors which might not have a counterpart in other dispensing operations at other hospitals.

To summarize, it was concluded that it is the differences in the *amounts* of each cost factor involved that causes drug prices to differ between hospitals, *not* differences in the *identity* of the cost factors themselves (if the suggested methods of handling manufacturing and preparation of parenterals are used). A basis for compiling comparable statistics about hospital pharmacy dispensing costs between hospitals had thus been established.

Why is this important? Besides being used as a basis for an accurate and explainable pricing schedule, recall the emphasis placed on statistics that are comparable between hospitals and the estimate that a savings of $50,000 (5 percent) could be effected annually in a 200 bed hospital if such statistics existed.

It was decided that the solution to the pricing schedule problem in hospital pharmacy might be a schedule based on the identical costs in each dispensing department, leaving any other unusual costs, plus profits, to each hospital pharmacist to be handled on an individual basis. In other words, a "Do-it-yourself Pricing Schedule Kit" could be the answer.

Our method of attack was decided upon:

1. A literature survey of pricing schedules used today, in both retail and hospital pharmacy, must come first.
2. A list of all important costs and expenses applicable to the price of drugs in hospital would have to be compiled and from these the ones common to every dispensing operation selected.
3. The definitions for the terms used for these cost factors should be carefully chosen and explained so as to be uniform to all attempting to use the schedule.
4. Methods to be used in obtaining these costs must be outlined in the interest of uniformity and service.
5. A sample schedule should be constructed out of material readily available in any hospital pharmacy, in order to establish a format and to demonstrate this operation.

Review of the Literature. The requirements of an ideal pricing schedule have been listed by several authors. For example, Yagle states that "to be successful, a pricing system must be fast, accurate, simple, versatile, and it must require no pencil work."[24] In a state-wide survey of retail drugstores in Wisconsin, the University of Wisconsin College of Pharmacy received requests almost unanimously for a pricing schedule that: (1) was simple to understand and use; (2) resulted in relatively uniform prices; (3) promotes consumer inter- and intra-professional goodwill; (4) can be tailored to fit individual prescription operations.[18]

In reviewing pricing schedules suggested for hospital pharmacy, the one proposed by Jeffries[8] appears outstanding. This schedule does not attempt to suggest the "selling price" of the prescription to the patient. It simply collects the costs applicable to the prescription and accumulates these as a total which is the "break-even" cost of the prescription to the pharmacy department, or to the hospital, depending upon which costs are applied. No attempt is made to include *all* the cost factors relative to the final price of the prescription, but only those factors which have the same identity in each pharmacy. No profit or mark-up is included or suggested. In the words of Dr. Jeffries, "It is based on the application of standard cost accounting procedures applied to the specialized practice of prescription dispensing."[23] For ease in applying his schedule, Jeffries developed the now familiar Universal Prescription Costing and Pricing Calculator, a convenient shorthand device which supposedly eliminates the need for arithmetical computation in arriving at the "break-even" cost.

It appeared that little or no improvement could be made on the principles of the Universal Calculator but it was felt that it could be modified to make it more adaptable to *hospital* pharmacy in particular and to conform more nearly with one part of the criteria for the ideal schedule. (The Universal Calculator is based on an overhead charge of $.20 per prescription and labor charge of $.07 per minute, which requires a modest amount of "pencil work" at the time each prescription is filled to adjust to any given pharmacy.)

The following cost factors, arranged in the form of a "Report of Operations," were believed to have counterparts in most hospital pharmacies. This form can be used in obtaining the total picture of operations over any time period. It includes return on investment, so that "sales" is included in the form, although we are not concerned with this factor in compiling the cost picture for our schedule.

Report of Operations

Sales ..... _____
Cost of Drugs
  Direct Expenses
    Materials (drugs) ..... _____
    Salaries of Dispensing Pharmacists _____
    Supplies charged to
      Dispensing Dept. ..... _____
  Indirect Expenses
    Depreciation
      Plant ..... _____
      Major Equipment ..... _____
      Minor Equipment ..... _____
    Electricity ..... _____
    Maintenance ..... _____
    Housekeeping ..... _____
    Water ..... _____
    Heating or Air Conditioning .... _____
    Administration ..... _____
    Accounting ..... _____
    Insurance ..... _____
    Investment in Inventory (10%) .. _____
    Free Floor Stock ..... _____
    Salaries of Pharmacy Staff
      not in Dispensary ..... _____
  Total Cost of Sales ..... _____
Net Operating Result ..... _____

Defining Terms and Suggesting Methods for Obtaining Costs. The first decision to be made after deciding to do a cost analysis regards the period of time over which the cost figures should be obtained. It is important that all costs and expenses be determined for the same period if possible. It is preferable if costs and expenses for the last 12 months can be obtained. However, if only the last three months are analyzed, the results can be fairly accurate as long as all costs are measured for the same three months period. If the costs and expenses for one year are not available, the next best thing would be alternate quarters, either the first and third or the second and fourth quarters. This would be better than a straight six-months compilation, since seasonal variations would be more accurately reflected. Even if costs can be determined only for one month, it will pay to analyze them anyway and apply the results to your pricing system. Later, as facts accumulate, the pricing schedule may be adjusted. Trying to relate prices to cost on the basis of the previous cost picture is taking full advantage of the only *real* indication of the future available to you.

Indirect Expenses. Starting with indirect expenses, because of the ease in dealing with them, it was agreed that these are definite expenses incurred by the hospital but from which the pharmacy benefits. The allocation of costs to each department must be somewhat theoretical, because the accounting costs themselves usually render the operation uneconomical. However, if any of these expenses directly applicable to the pharmacy department (for instance, housekeeping), are available, by all means the most accurate figure available should be used. It is always wise to ask the administrator or comptroller how the hospital allocates these costs if such a policy has been made. If no such policy exists, then the pharmacist must take the initiative.

Many hospitals allocate these costs by departmental floor area. For the sake of simplicity this could be done by any pharmacist. Simply obtain the total hospital cost for each item from the administrator or comptroller and prorate the cost on the basis of the percentage of total hospital floor space occupied by the pharmacy department.

Depreciation. Calculating depreciation costs requires special considerations. There are several methods of figuring depreciation in hospitals. Some use a sliding-scale system of some type while others use the straight-line method. Depreciation of the building itself can usually be had for the asking, the pharmacy department's share being derived by proration as to floor area as shown above. Depreciation of major and minor equipment may require a little more work. If no depreciation schedule is set up for these classifications, it can be done on major equipment by "guesstimating" the salvage value at the end of its probable life, subtracting this from the price paid for the equipment, and dividing the difference over the average life. This is usually 10 years. Minor equipment usually is considered to have a life of 5 years but many businesses apply the full depreciation at the time of initial purchase. Subsequently, they no longer depreciate "minor equipment" but merely assign the replacement cost to the appropriate period as an indirect expense. We believe the latter should be the case in hospital pharmacy since most equipment classified as minor (for example, spatulas, mortars, counting trays, etc.), is not very expensive.

Inventory Investment. It should be remembered that the total amount of money invested in inventory would be collecting interest (usually 3 percent) if it were in the bank. This "lost" interest should be recognized as part of the cost of doing business and accordingly should be returned by the patient if costs are to be met.

Further, since hospital pharmacy usually is required to maintain a large inventory of items with practically no turnover as a service to an occasional patient, the cost of this service must be considered. Also, a certain amount of inventory consisting mostly of opened, non-returnable packages, becomes dead stock for which credit cannot be obtained.

The literature reveals little work done in this area in hospital pharmacy. Five percent of the total inventory investment has been used in costing the manufacture of parenterals, while 15 percent has been suggested as compensation for dead stock in the retail drug store (this last percentage being based on total *sales*).[24,25]

The best solution to this problem is to obtain as many *facts* as possible. It should be possible to obtain an estimate of total inventory value from which the interest loss can be calculated. Many hospitals will even be able to report accurately their dead stock losses also. It is suggested, however, that for those hospital pharmacists who find this item

difficult to deal with, the *Inventory Investment* cost item could be calculated as 10 percent of the average inventory value and then divided evenly over the 12 months of the year.

FREE FLOOR STOCK. Since it is the general opinion among hospital administrators (and hospital pharmacists) that routine drugs such as pentobarbital, phenobarbital, aspirin, milk of magnesia, etc., should be free, the total cost for such items must be obtained. This is usually done by costing all interdepartmental floor stock issue requisitions for the measured time period and totaling them.

SUPPLIES. Supplies used in the dispensing department of the pharmacy (paper, pencils, etc.) can be easily accounted for. Naturally, if the pharmacy has no other sub-departments such as manufacturing, parenterals, etc., then the *total* amount charged against the pharmacy by accounting would be the desired figure. This would hold true as applied to any of the costs involved.

LABOR. The labor costs in a hospital pharmacy can be divided into: (1) Dispensing, (2) Manufacturing, (3) Clerical, and (4) Supervisory. One system for allocating these costs is as follows:

1. *Dispensing*—
   a. Pharmacists—The cost of professional labor per prescription is based on the total number of man-hours of all *pharmacists* who are employed in the dispensing department and who have as their principle duty the dispensing and compounding of prescriptions.[18]
   b. Couriers—If delivering for the dispensing department is their principal job, then use the full salary figure; otherwise, prorate the salary according to the proportion of time spent in the dispensary.
2. *Manufacturing*—Cost analyses of manufacturing programs appear in the literature and will not be touched on here. All the costs going into a manufactured item should be calculated and the total listed as the cost of the product as it enters the dispensing department inventory.
3. *Clerical*—This includes all pharmacy clerical personnel not directly responsible to any subdepartment in the pharmacy. This expense may be allocated as per the ratio of the total expense applicable to the manufacturing, dispensing, and other sub-departmental operations.[26]
4. *Supervision*—This includes the pay of the chief pharmacist and any other supervisory personnel. The cost applicable to dispensing may be determined by proration of total salaries on the basis of time devoted to the dispensing operation.

COST OF DRUGS. Choose a standard cost for each unit of issue (tablet, ampul) of each drug. Then, as new stock arrives, the receiving clerk can record the difference between the standard cost and the actual cost under the title "Pharmacy Material Variations." At the year's end, this discrepancy can then be used to adjust the accounts "Cost of Materials Consumed" and "Inventory at End."[26]

Whether standard cost should be based on actual cost or on the wholesale cost of the closest quantity depends upon the type of institution involved.[27] Some contend that certain teaching hospitals use the low cost of medications to attract patients to their clinics. Since these hospitals will ordinarily practice quantity buying to obtain lowest drug prices, it follows that they would base standard costs on actual costs. In other hospitals, standard costs may be justifiably based on the wholesale cost of the next smaller package available. In the latter instance, good accounting practice dictates that the revenue accrued by this, over and above the income realized from the ordinary return when based on actual cost, should be entered under the account "Savings from Quantity Buying." This can then be evaluated against the cost of extra investment and storage expense. Quantity purchasers are reminded that they should not be too ready to give away quantity buying advantages, because increased turnover cost eventually absorbs a substantial part of the initial price advantage as dwindling stock balance runs into the second and third period.[23]

SALE OF DRUGS TO OTHER DEPARTMENTS. A question related to the problems under consideration is how to handle sales of drugs to other departments. It is suggested that the cost basis for departmental sales be the invoice cost of the items to the pharmacy.[26] It is true that the mere handling of these items imposes an operating cost upon the pharmacy but the amount is usually small. Attempting to charge operating costs on transfer of items between departments in a hospital might be considered false economy as far as hospital accounting is concerned.

Using the Cost Analysis

First, the "Report of Operations" must be completed. A copy of this should then be submitted to the administrator along with suggestions for using the data as supporting evidence in solving any of his problems which were discussed in the first part of this paper. At the same time, any discrepancies in the pharmacy drug-charge situation which you feel these figures reveal can be brought to his attention.

The latter can be accomplished by applying the statistics to representative inpatient and outpatient prescriptions. This consists of assigning to each prescription its appropriate share of each of the four basic cost components: (1) cost of ingredients, (2) cost of container, (3) cost of direct labor, and (4) overhead. The total of these components will yield the actual break-even cost of the prescription to the hospital pharmacy. Add to the cost total for each prescription the return desired by the administration to arrive at the prescription price to the patient.

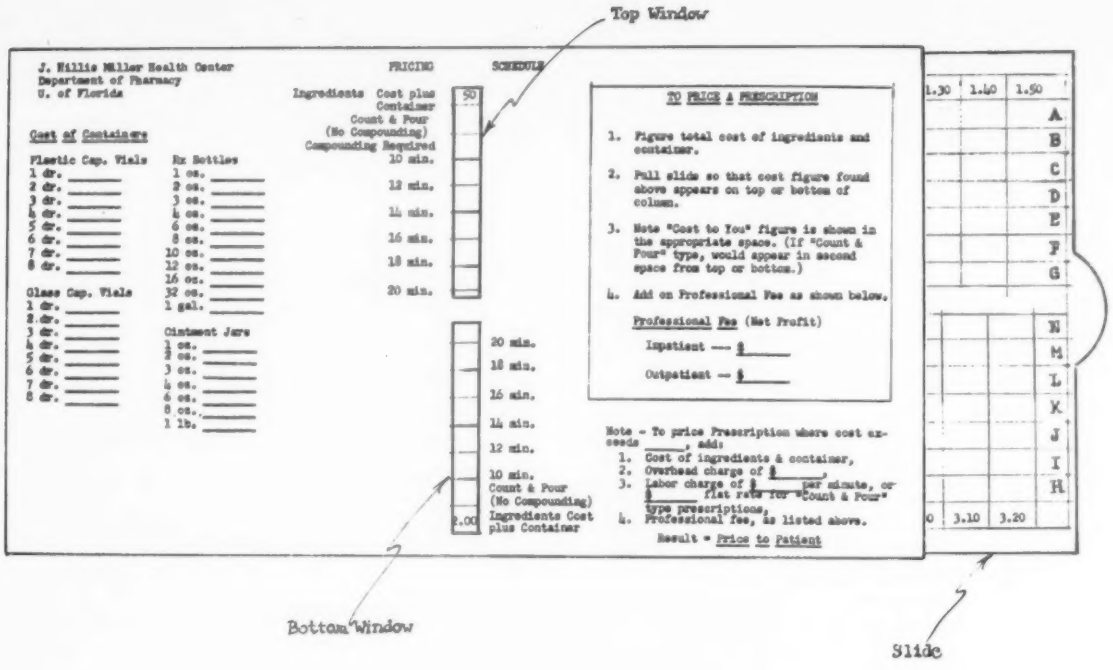
For the cost components listed above, *cost of ingredients* will be obtained from the standard cost previously determined for each item and conveniently recorded either on the side of the bottle or container, on the shelf, or in some other readily accessible place. *Cost of container* will be the actual price paid. Standard costs may be tabulated for these items too and, if desired, recorded on the face of the pricing schedule. The *overhead* charge may be figured by adding up all the indirect and direct expenses except the cost of drugs and direct labor. Divide this number by the number of prescriptions filled during the period analyzed. The resulting figure should also be recorded on the front of the schedule. Now all costs which have a counterpart in other hospital pharmacies can be applied to each prescription you fill.

Among the questions arising at this point with which the pharmacist is directly concerned is: "Should outpatients be charged a different price than inpatients?" There are many different opinions on this question. Because of this, no account was taken of a possible difference in compiling the four basic components of a pricing schedule. The solution is simple however. Determine if a difference in the costs going into different prescriptions does exist and, if so, (assuming you believe this difference should be reflected in the price) merely add an equal portion of the costs in question to those prescriptions with which you are concerned. You will note later, in making your own pricing "calculator," that these factors can be included in the schedule itself at the time you assemble it. Once you have your "calculator" assembled you need never pick up a pencil to figure a price.

Don't forget this point: if the administrator includes in the expected return from the pharmacy a certain amount to cover nursing service losses, be sure to list this *separately* in your report of operations to him. When discussing individual prescription prices, be sure to point out this component to those interested. These are the facts, based on your cost analysis. Their use is limited only by your ability and imagination.

Construction of the Schedule

After all costs and expenses have been compiled, it is time to consider the actual physical construction of the "calculator." The materials required are a 12″ x 9″ manila folder, some stiff, white card stock (Bristol is satisfactory but another manila folder may be used in its absence), a stapler and some scotch tape. The only machinery required is one wide-carriage typewriter, preferably with elite type. The de-


Top Window
J. Hillis Miller Health Center
Department of Pharmacy
U. of Florida
PRICING SCHEDULE
Ingredients Cost plus Container
Count & Pour (No Compounding) Compounding Required
10 min.
12 min.
14 min.
16 min.
18 min.
20 min.
Cost of Containers
Plastic Cap. Vials
Rx Bottles
Glass Cap. Vials
Ointment Jars
TO PRICE A PRESCRIPTION
1. Figure total cost of ingredients and container.
2. Pull slide so that cost figure found above appears on top or bottom of column.
3. Note "Cost to You" figure is shown in the appropriate space. (If "Count & Pour" type, would appear in second space from top or bottom.)
4. Add on Professional Fee as shown below.
Professional Fee (Net Profit)
Inpatient — $
Outpatient — $
Note - To price Prescription where cost exceeds ____, add:
1. Cost of ingredients & container,
2. Overhead charge of $ ____,
3. Labor charge of $ ____ per minute, or $ ____ flat rate for "Count & Pour" type prescriptions,
4. Professional fee, as listed above.
Result = Price to Patient
Bottom Window
Slide

sign of the device is based on the simple and familiar slide-rule principle. The overall dimensions are 12 inches by 6½ or 7 inches. It is most easily constructed by cutting off both leaves of a manila folder, parallel with and 6½ or 7 inches from the fold. Next, cut two windows measuring approximately 2-¾" or 3" by ⅜ inches, one above the other, and at the center of one leaf of the folder as shown in Figure 1. Now tape the two leaves together with cellophane tape along the cut edges to form a sleeve. The "slide" can be cut 12 inches long by a little under 6½ or 7 inches wide, or just wide enough to allow it to slide easily back and forth when inserted into the completed sleeve. Affixing short tabs on either end of the slide will make it easier to move from the closed or middle position.

After the physical construction of the "slide rule" has been completed, fill in the legend information on its face as shown in Figure 1.

To complete the "slide" itself, rule horizontal lines the full width of the slide, spaced in correspondence to the entries beside the windows. There will be seven horizontal rows for each window. Now rule vertical columns the same width as the window openings clear across the slide. Label the rows as shown in Figure 1.

Now, using the topmost and bottom-most lines on the slide (opposite "Ingredients' Cost plus Container" in the two windows), starting at the left end of the topmost line and working toward the right, write or type "cost" values, beginning with $0.20 and increasing by $0.05 (or $0.10) at the end of each column until all columns are used. (for example: $0.20, $0.25, $0.30, $0.35, $0.40 . . . $0.90, $0.95, $1.00, $1.10, $1.20, $1.30 etc.) Now move to the bottom line and continue either from the right or left (it makes no difference) writing in the cost figures. If the columns are kept the same width as the windows (⅜") it will be possible to make approximately 29 columns. Numbering in $0.05 increments up to $1.00 and $0.10 increments thereafter, it will be possible to include costs from $0.20 to $2.20 on the top line and from $2.30 to $5.00 on the bottom line. (The columns on the slide pictured in Fig. 1 are too wide, with the result that the highest cost value obtainable was $3.20.)

With the slide completed, the next step is to fill in the correct figures as they apply to your institution. In principle, the rules used in pricing a prescription are applied to the filling in of the spaces on the "slide." For example, to figure the price of a non-compounded item costing 15c for ingredients and 5c for container, align the slide so that the figure $0.20 in the top row appears in the upper window. Now refer to the first blank space under the figure $0.20, (designated "A" on the slide). There place the sum of:

1. Cost of ingredients plus container (20c in this case).
2. Overhead charge per prescription (as determined for your operation).
3. Labor charge (flat rate charge in this case since line "A" is for count and pour type prescriptions).
4. Professional fee. (This should be omitted and added on for each prescription at the time it is filled if you charge outpatients and inpatients differently.)

Do this all the way across line "A." A progression will soon appear that will make the job easier. For line "B," merely add to the figure in row "A," the cost of 10 minutes of the pharmacists time. On line "C," add to the figure in row "A" the cost of 12 minutes of the average pharmacists time, etc. Repeat the same operations for the cost figures in the bottom row and record in the appropriate spaces in the lower window.

The professional fee which you should place on the front of the schedule as illustrated is composed of nonidentical costs (between hospitals) plus the return desired by the administrator; therefore, this fee should be decided by, or at least approved by, the administrator himself.

Report of Application of the Proposed Pricing System

Using the methods previously described in this paper, a cost analysis of the University of Florida Teaching Hospital Pharmacy dispensing operation was made and the pricing system revised in accordance with the results of this analysis. To prevent alarming the administration with a sudden drop in total income, the pricing system was adjusted to return exactly the same income as had the previous system but with the added advantage of having the actual cost components of *each* prescription price easily obtainable by simple calculation.

When the cost of operation for the dispensing department was calculated, it was shown that all costs could be recovered by adding $ .40 onto the wholesale cost of each prescription filled. Accounting records disclosed that the *average* return

above cost of drugs per prescription for the preceding month was $1.70. The conclusion drawn from these figures was that the average prescription filled at the Teaching Hospital had these three components in its price to the patient: (1) the wholesale cost of the ingredients, (2) an overhead expense of approximately $ .40, and (3) a "profit" of $1.30. Thus, to price an inpatient prescription using the new system, $1.70 would be added to the wholesale cost of the prescription ingredients (container cost being included in overhead expense). An example of an inpatient prescription as now priced at this hospital is as follows:

Rx Chloramphenicol capsules 250 mg. No. 10	
Cost of drug ($.26 x 10)	$2.60
Overhead & "Profit"	1.70
Total price	$4.30

It should be noted here that at the time this schedule was put into effect, this hospital had been in operation only a short time, and therefore, no figure had been established which represented the revenue expected from the hospital pharmacy operation. However, it was decided that the figure $1.70 would be used as the overhead-plus-profit charge, since this would return approximately the same revenue as had the previous pricing system. Thus, the results would approximate the situation in which many hospital pharmacists attempting to implement this system would find themselves (that of being required to make up deficits in other departments).

For an inpatient prescription that required compounding, the overhead-plus-profit charge was listed as $1.30, thus leaving out the labor cost which was then computed separately at a cost of 8c per minute. Outpatient prescriptions were priced in accordance with rules discussed with the local retail pharmacist's group . . . this being a 40 percent margin plus a $1.00 professional fee.

To date, this pricing system has been in effect five months. During this time, practically no complaints have reached the pharmacy regarding the price of drugs to inpatients (which was not true in previous months), while the outpatient dispensing department has received the usual number of complaints about the "high" price of drugs. These complaints, incidentally, came from both patients *and* physicians. It would seem that people ignorant of the factors contributing to the cost of drugs are psychologically prepared to pay at least $2.00 every time they are charged for drugs, while it is the extremely high prices for certain expensive drugs (regardless of values) that patients complain about.

Staff physicians have expressed approval of the new system because those expensive drugs that certain patients *must* have in the more serious illnesses can now be more readily used when needed without imposing upon the patient a burden almost comparable to the illness itself. This is not true with every drug, of course, but it is certainly true of most of those used in modern therapy.

Some Final Notes and Observations

Compiling a readily available source of drug costs-per-unit (standard costs) is probably the most time consuming job involved. Furthermore, the cost will likely need revision at least once a year. Most larger hospital pharmacies already have this information available, being able to afford the necessary clerical personnel and equipment, but in the smaller hospital the job of compiling such a reference for daily use may be quite time consuming.

A drug distribution system in which drugs are priced in quantities representing several days supply is particulary adaptable to this system. In those hospitals using the "total floor stock" system, the cost of supplying medication is not so easily allocated to each particular prescription item administered. The overhead-plus-profit charge in these hospitals could be figured on a "unit-administered" basis however.

It was found that the pricing system was so simple to use that after a week the pricing schedule itself was rarely consulted. This might not be true in other hospital pharmacies, especially where personnel turnover is greater.

Those interested in the philosophical connotations of pricing systems which deny a necessary relationship between the wholesale cost of the ingredients and the amount of profit made on the prescription should read "The New Philosophy of Professional Fees" by Professor H. J. Fuller, U. of Toronto, Ontario, appearing in the *American Professional Pharmacist* in the issue for August of 1960.

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CATALOGING A PROBLEM?

Figure 1

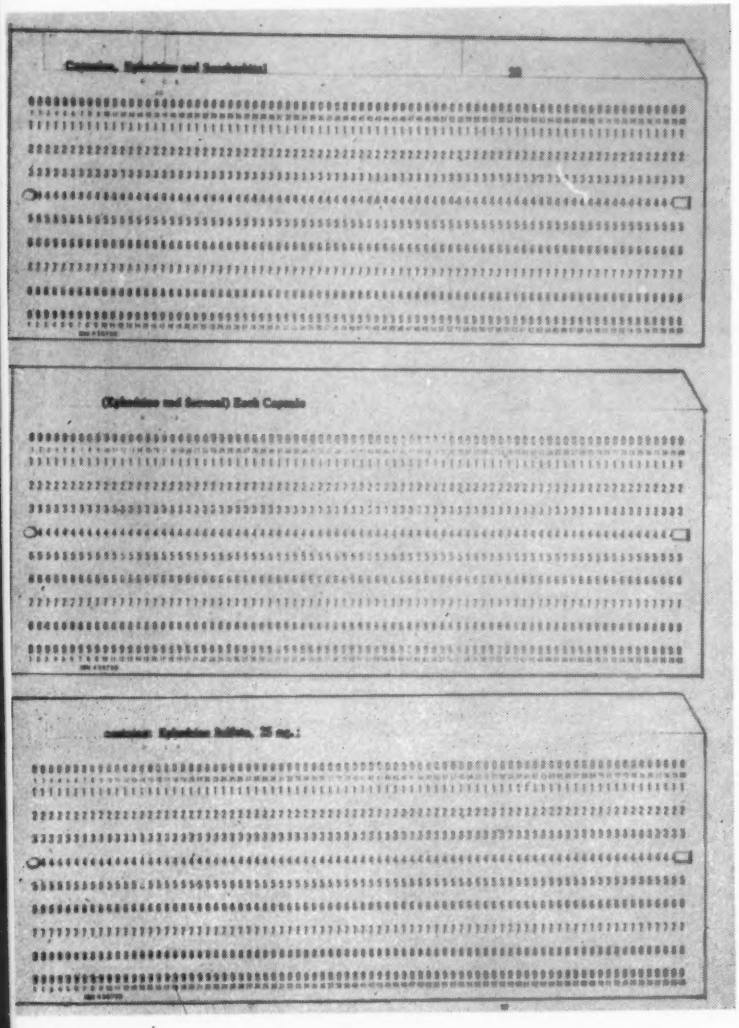


Figure 2

PHARMACEUTICALS

	STRENGTH	UNIT
ACIDIFYING AGENTS		
AMMONIUM CHLORIDE		
Injection, Solutions, Sterile, Intravenous See Page		
Tablets	0.3 Gm.	100
Tablets, Enteric Coated	0.5 Gm.	100
Tablets, Enteric Coated	1.0 Gm.	50
SODIUM BIPHOSPHATE Sodium Acid Phosphate Sodium Dihydrogen Phosphate		
Tablets	0.3 Gm.	100
ADRENERGIC AGENTS (Sympathomimetic)		
EPHEDRINE SULFATE		
Capsules	25 mg.	30
Capsules, Ephedrine and Pentobarbital (Ephedrine and Nembutal) Each Capsule Contains: Ephedrine Hydrochloride, 25 mg.; Pentobarbital Sodium, 25 mg.		20
Capsules, Ephedrine and Secobarbital (Ephedrine and Seconal) Each Capsule contains: Ephedrine Sulfate, 25 mg.; Secobarbital Sodium 50 mg.		20
Injection	25 mg./ml.	1 ml.
Injection	50 mg./ml.	1 ml.
Solution	3.0%	30 ml.
EPINEPHRINE Adrenalin®		
R Inhalation	10 mg./ml.	5 ml.
R Injection	1 mg./ml.	1 ml.
Injection in Oil, Sterile Suspension	2 mg./ml.	1 ml.
R Topical	1 mg./ml.	30 ml.
ISOPROTERENOL HYDROCHLORIDE Aludrine® Isuprel®		
Injection	0.2 mg./ml. (1:5000)	1 ml.
Tablets, Sublingual	10 mg.	30
ISOPROTERENOL HYDROCHLORIDE AND CYCLOPENTAMINE HYDROCHLORIDE Aerolone Compound® Aludrine and Clopane Compound®		
Inhalation Isoproterenol Hydrochloride, 0.25 Gm. Cyclopentamine Hydrochloride, 0.5 Gm. Propylene Glycol, q.s. Purified Water, to make, 100 ml.	0.5% (1:200)	30 ml.

R - Refrigerate
® - Trade Marked

1

► For years, hospital pharmacists have been struggling with the problem of cataloging their items in stock or preparing a formulary. Various methods have been employed, but all have been time consuming and expensive in their manpower requirements.

To prepare a formulary or catalog listing, an efficient system should be used which will be utilized in later revisions without repeating the typing, proofreading, and other tasks. Such a system, in which only the changes or additions need to be typewritten and proofread, is described below:

Each line to be printed is typewritten onto a special data processing card (Figure 1) by means of a Varitype typewriter by one of the several contract companies performing such services. A separate card is used for each line, including a blank card for each blank line in the final listing. Margin indentations, shown in the final print (Figure 2), are determined by the position of the typing on the data card.

A photographic process proof is provided, allowing a pharmacist or other proofreader to correct errors which are subsequently corrected on replacement cards.

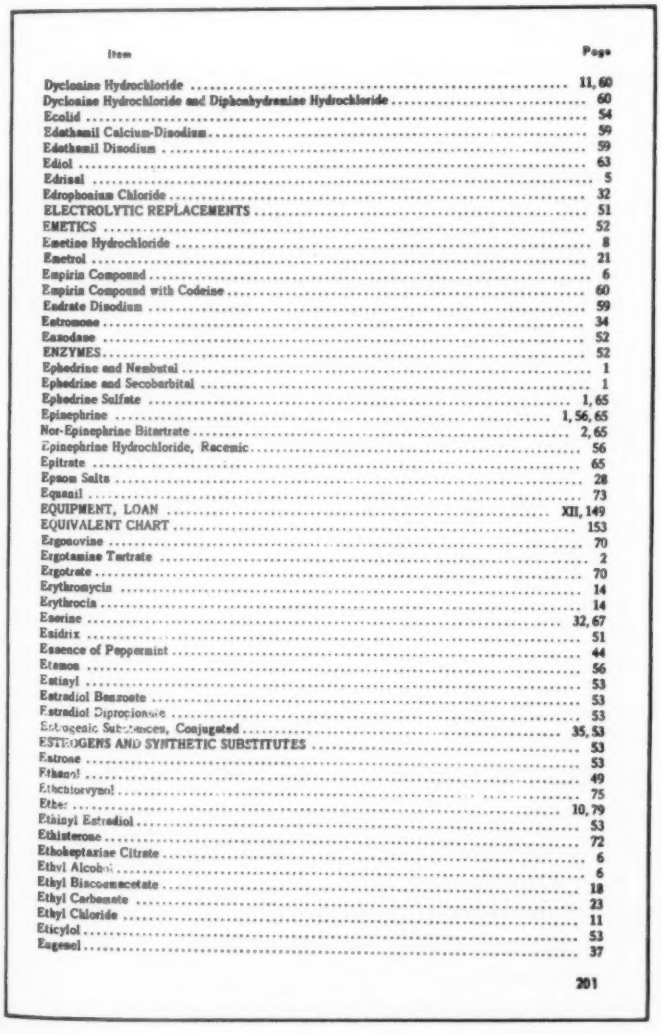
The completed data processing cards are placed into a high-speed automatic camera which prepares a long negative with page numbers and page headings appropriately placed. From this negative, the pages are printed (Figure 2). Note the three line items in Figure 1 as they eventually appear in the center of the illustrated page (Figure 2). Figure 3 illustrates the index prepared by typing additional individual cards with the page numbers obtained from the page proof.

The advantage of this method of preparation is that only additions or corrections need to be typewritten onto new cards. Cards are simply removed from the file for deletions. This provides an up-to-date formulary or catalog listing which can be reprinted with a minimum expenditure of profesional manpower.

Milton W. Skolaut is Chief, Pharmacy Department, The Clinical Center, National Institutes of Health, United States Public Health Service, Department of Health, Education, and Welfare, Bethesda, Maryland.

by MILTON W. SKOLAUT

Figure 3



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Therapeutic Trends

edited by WILLIAM JOHNSON, *Bronson Methodist Hospital, Kalamazoo, Michigan*

Oxygen In Treatment Of Anaerobic Infections

Brummelkamp *et al.* report in *Surgery 49*:299 (Mar.) 1961 the use of oxygen in the treatment of anaerobic infections. Preliminary experiments, using guinea pigs as test animals, indicated that oxygen under hyperpressure exerts a favorable influence on clostridial infections, and that this principle can be employed in the treatment of patients with this severe disease or other anaerobic infections. The oxygen treatment consists of placing the patient in a hyperpressure tank and submitting the patient to a pressure of three atmospheres (absolute) while inhaling pure oxygen. Drenching the tissues with pure oxygen in a hyperpressure tank was used in the successful treatment of four cases (1 with Cullen ulcer and 3 with clostridial myositis).

WILLIAM E. JOHNSON

SU-4885—A Diagnostic Agent In Pituitary And Adrenocortical Disorders

Eighty-six patients received standardized intravenous methopyrapone (SU-4885) in tests designed to evaluate ACTH reserve. Compared to a normal rise in 24-hour urinary 17 - ketogenic steroids of from 12 to 15 mg., patients with hypothalmic lesions showed a markedly reduced response, as did those with nonfunctioning pituitary tumors generally. However, when associated with acromegaly, the response was usually normal.

In the presence of Cushing's syndrome, a normal or greater than normal response was noted in patients with overactivity of the adrenal cortices in the absence of demonstrable tumors. In contrast, two cases of carcinoma and two cases of adenoma failed to show a significant rise in 17 - ketogenic steroids, making this a useful differential point. Adrenal insufficiency and hypothyroidism, as well as uncontrolled hyperthyroidism, seemed to decrease the response to SU-4885 markedly.

Four cases with a poor preoperative response to SU-4885 showed a significant rise in urinary 17-ketogenic steroids in surgery, demonstrating that a negative response to SU-4885 does not necessarily call for corticoid coverage during operation. Methopyrapone (SU-4885) appears to be a useful diagnostic adjunct in diseases of the hypothalmic pituitary adrenal area, provided that abnormalities of thyroid function and primary adrenal insufficiency have been ruled out. This author's summary by Gold *et al.* is reported in *Ann. Internal Med. 54*:175 (Feb.) 1961. SU-4885 is a product of Ciba Pharmaceuticals.

WILLIAM E. JOHNSON

Methaqualone As A Hypnotic

An investigation of methaqualone, a synthetic nonbarbiturate hypnotic, was done by Parsons and Thompson and reported in *Brit. Med. J.* (Jan. 21) 1961, page 171. This investigation was designed to assess the relative merits of methaqualone and a standard dose of cyclobarbitone; an inert tablet being used as a control. Other aspects of the pharmacological action of the drug were not studied. The conclusions were that methaqualone in a single dose of 150 mg. is a reliable hypnotic and that no important difference could be detected between the hypnotic action of 150 mg. of methaqualone and 200 mg. of cyclobarbital. Methaqualone for this study was supplied by Boots Pure Drug Company, Ltd. (Great Britain).

KENNETH W. HUCKENDUBLER

Clinical Experience With AB-100

AB-100, a union of two compounds, each showing anti-tumor activity, was synthesized in an attempt to overcome some of the limitations of single action antitumor compounds. This compound was formed by uniting the bis (ethylenimido)-phosphoro radical through an amide linkage to urethan. Safely given intravenously, intrapleurally and intraperitoneally, AB-100 showed best results when given in weekly doses as against single monthly doses. Twenty-five of 123 patients receiving the drug showed some improvement. The improvement of 4 of the 25 has lasted more than three months. This report was done by Weeth and Segaloff and reported in the *Southern Med. J. 54*:39, (Jan.) 1961.

KENNETH W. HUCKENDUBLER

Evaluation Of Trisodium Calcium Diethylenetriaminepentaacetate (DTPA)

Faney *et al.* studied the effects of DTPA and its ability to remove iron. Comparisons were made with EDTA. The results of their studies were reported in *J. Lab. Clin. Med. 57*:436 (Mar.) 1961. New agents for the removal of iron are needed. The tests indicate that significant amounts of iron can be removed from the body by chelation with DTPA. Two hundred and twenty-five milligrams of iron were removed from one

patient using four doses of DTPA totaling 14.5 grams. Seventeen doses totaling 22.5 grams were used on another patient resulting in the removal of 660.7 mg. These figures, as compared to 250 mg. removed with one pint of blood, are much greater than reported with other chelating agents. There was neither local nor systemic toxicity to DTPA after repeated intramuscular injections. The binding power of DTPA to iron was proven to be greater than the binding power of EDTA. DTPA also shows a greater affinity for strontium and cobalt. There was little if any clinical toxicity and no significant effect on hemogram, urinalysis, blood urea nitrogen or serum calcium. Prothrombin times were only slightly prolonged. The results suggest a possible use of DTPA as a supplement to phlebotomy in the treatment of hemochromatosis and as an alternative therapy for individuals with iron storage disease who could not undergo phlebotomy. DTPA was supplied by Geigy Chemical Corporation.

RICHARD H. HARRISON

Etrynit For Angina Pectoris

For any drug to equal glyceryl trinitrate in the treatment of angina pectoris, it must be shown to be as effective, as harmless, and as inexpensive. Its effectiveness can be judged by the rapidity of onset and the duration of effect. A new preparation, the trinitric acid ester of trimethylol propane (Etrynit), has been found to be of clinical value. This study conducted by Sowton and Oram is concerned with the rapid relief of pain in the acute attack of angina pectoris. The results were reported in *Brit. Med. J.* (Mar. 18) 1961, page 794.

A double blind study was conducted comparing the new drug with glyceryl trinitrate. Thirty-five patients were treated. The patients were given two boxes of medications. One contained glyceryl trinitrate, the other Etrynit. They were instructed to use all of one box before starting on the other. They were further instructed to report on the effectiveness of each. Of the thirty-five patients, only 22 completed the trial. Of these, 12 preferred glyceryl trinitrate and 10 the new drug, Etrynit. The drug did prove to be as effective as glyceryl trinitrate. The usual dose is 10 mg. sublingually but in most cases 5 mg. is adequate. Side effects were minimal and less severe with Etrynit. Further studies are justified.

RICHARD H. HARRISON

Substance M, An Antitubercular Antibiotic Of Tissue Origin

The name substance M has been given to a group of antituberculous substances that can be found in the organs of mammals showing no signs of active or previous tuberculosis. The lungs seem to be the richest source. The product after extraction and purifications is lyophilized. It appears as a white pseudocrystalline, water soluble, thermostable, powder. Further purification results in a number of fractions. Two of these have been labeled M-1 and M-2. M-1 is a polypeptide. Mascherpa has conducted several studies and reported the findings in *Antibiotic Med. & Clin. Therapy* 7:45 (Jan.) 1961. All the active fractions of substance M show *in vitro* both bacteriostatic and bacteriocidal activity for different strains of *Mycobacterium tuberculosis,* at concentrations of from 500 to 4000 mcg./ml., depending on the inoculum, the protein concentration in the substance and chiefly the degree of purification of substance M. Substance M, even in the presence of a number of impurities, has a limited toxicity. The LD 50 intravenously is between 350 and 750 mg./Kg. in albino mice. The clinical studies have not been too extensive thus far due to limited material. Twenty patients were treated with substance M and had either never been treated before or were not amenable to treatment with the other antitubercular agents. A general improved condition was noted in these patients. Further investigations seem warranted for this agent.

RICHARD H. HARRISON

A Non-Hydrazine Monoamine Oxidase Inhibitor With Antihypertensive Properties

The compound, N-benzyl-N-methyl-2-propynylamine hydrochloride (MO 911), is shown to be a potent monoamine oxidase inhibitor with hypotensive properties in man. Nine subjects were treated with 100 to 125 mg. initial doses and from 37.5 to 75 mg./day maintenance doses of MO 911. Since its structure is different from that of previous inhibitors, the findings reported by Horwitz and Sjoerdsma and reported in the *Proc. Soc. Exp. Biol. Med. 106*:118 (Jan.) 1961 support the hypothesis that effective inhibition of monamine oxidase results in orthostatic lowering of blood pressure, presumably by selective decrease of sympathetic nerve activity. Extensive clinical trial of the drug as an antihypertensive is warranted. MO 911 was supplied as 25 mg. tablets by Abbott Laboratories.

SYLVIA SCHMIDT

Dihexyverine—Anticholinergic Agent

Dihexyverine was administered to 31 patients with various gastrointestinal diseases at a dosage level of 20 mg. four times daily. Controlled studies were made by Printer *et al.,* and the results are reported in *Appl. Therap. 2*:835 (Nov.) 1960. Studies were made in two groups using dihexyverine as a single agent and incorporating it in a double blind study against atropine and placebo (11 cases). Dihexyverine was effective in improving symptoms in 75-80 percent of the cases. This effect was similar to that of atropine, 0.6 mg. four times a day, and superior to that of the placebo. Dihexyverine was supplied by Leeming-Miles Company in the form of Metaspas tablets.

SYLVIA SCHMIDT

Timely Drugs

Dornavac

CHEMICAL COMPOSITION: Desoxyribonuclease, extracted from beef pancreas and lyophilized.

INDICATIONS: Because it depolymerizes desoxyribonucleoprotein, it is used to decrease the viscosity of purulent material in bronchopulmonary infections, tracheitis sicca, cystic fibrosis, and urologic infections. The preparation possesses some proteolytic action, probably owing to small amounts of trypsin and chymotrypsin.

SIDE EFFECTS: Local irritation is infrequent; undesirable systemic effects ascribable to the absorption of liquefied secretions have not been reported.

PRECAUTIONS: Sensitivity index is extremely low; sensitivity reactions occur on prolonged therapy. The possibility of sensitivity to beef protein exists. The preparation should not be administered by the parenteral route.

DOSAGE: Bronchopulmonary infections: inhalation therapy by aerosol of 50,000 to 100,000 units once to four times daily for one to seven days. Cystic fibrosis: aerosol therapy of 50,000 to 100,000 units 2 to 3 times daily for a week or more. Urologic conditions: 100,000 to 300,000 units in 10 to 30 ml. of Sodium Chloride Injection as an irrigating solution from one to four times daily for 5 to 10 days. Tracheitis sicca: solution containing 100,000 units is forced with a needle and syringe into a narrow-gauge polyethylene tubing previously inserted into the trachea.

PREPARATION: Lyophilized powder containing 100,000 units of pancreatic desoxyribonuclease.

PACKAGING: Vials with vacuum-tight closure, together with one 2 ml. vial of sterile diluent (isotonic sodium chloride solution).

SUPPLIER: Merck Sharp and Dohme.

Parnate

GENERIC AND CHEMICAL NAMES: Tranylcypromine sulfate; trans-dl-2-phenylcyclopropylamine.

INDICATIONS: A monoamine oxidase inhibitor indicated for relief of symptoms of mental depression which may include dejected mood, self-depreciation, lowered activity levels, disturbed eating and sleeping patterns. In psychiatry, it is indicated in reactive and other psychoneurotic depressions, involutional melancholia, depressive phase of manic-depressive psychosis, and psychotic depressive reactions.

SIDE EFFECTS: Restlessness, overstimulation, insomnia. May notice some weakness, drowsiness, dizziness, dry mouth, or occurrence of occasional headaches. Symptoms of postural hypotension are commonly seen. Other infrequent effects are tachycardia, urinary retention, anorexia, skin rashes, edema, impotence, blurred vision, tinnitus, chills, sweating, muscle spasm and tremors, and palpitations.

PRECAUTIONS: Not recommended in patients with a history of liver disease or with abnormal liver function tests. Caution advised in patients with impaired renal function because of possible cumulative effects and also in patients with recent myocardial infarction or coronary artery disease with angina. Potentiates certain drugs, e.g., sympathomimetics, central nervous system depressants, hypotensive agents and alcohol.

DOSAGE: Standard dosage: recommended initial dosage of 10 mg. b.i.d. in the morning and afternoon and continued for 2 to 3 weeks. If no response appears dosage is increased to 20 mg. upon arising and 10 mg. in the afternoon for a period of one week. After satisfactory response is obtained, the dosage may be reduced to maintenance level. Intensive dosage, intended for hospitalized patients or those under comparable supervision: Initial dose is 20 mg. in the morning and 10 mg. in the afternoon and continued for 1 week. If no response appears, the dosage is increased gradually in increments of 10 mg. per day, at intervals of 1 to 3 weeks and then is reduced gradually to maintenance level. Dosages above 60 mg. per day are not advisable.

PREPARATIONS: Tablets of 10 mg. tranylcypromine sulfate.

PACKAGING: Bottles of 50 and 1500 tablets.

SUPPLIER: Smith, Kline and French Laboratories.

Plegine

GENERIC AND CHEMICAL NAMES: Phendimetrazine bitartrate; d-3,4-dimethyl-2-phenylmorpholine bitartrate.

INDICATIONS: A central nervous system stimulant used as an appetite-depressant in treating obesity or weight problems. Structurally, it differs from phenmetrazine, N.N.D. by the presence of an N-methyl group and is a d-isomer rather than a racemic mixture.

SIDE EFFECTS: In clinical practice, nervousness, insomnia, nausea, and cardiovascular complications are seldom seen. Mouth dryness, blurring of the vision, dizziness, constipation, and stomach pain have been noted.

CAUTION AND CONTRAINDICATIONS: Caution advised in highly nervous or agitated individuals. Not recommended for patients with coronary disease, severe hypertension, or thyrotonicosis.

DOSAGE: Usual dose is 35 mg. b.i.d. or t.i.d., one hour before meals. A dietary regimen is advisable conjunctively.

PREPARATIONS: Tablets, scored, containing 35 mg. phendimetrazine bitartrate.

PACKAGING: Bottles of 100, and 1,000 tablets.

SUPPLIER: Ayerst Laboratories.

Poliomyelitis Vaccine, Aluminum Phosphate Adsorbed

CHEMICAL COMPOSITION: A polio vaccine prepared in the usual manner from polio virus, Types 1, 2, and 3, grown on monkey kidney tissue cultures and inactivated with formaldehyde and supplemental ultraviolet irradiation and further prepared by adsorbing the vaccine on aluminum phosphate suspension with the aid of a small amount of protamine sulfate. It also contains only a small minute trace of penicillin (less than 0.0000005 unit per 0.5 ml. dose) and small residual amounts of streptomycin (less than 2.5 mcg. per 0.5 ml. dose).

INDICATIONS: Indicated for immunization against paralytic poliomyelitis, either for the complete series or as a booster for patients who previously have had the fluid polio vaccine. The vaccine has the advantage of smaller dose, reduced extraneous protein, antibody response at least comparable to the fluid-type vaccine, and very low residual antibiotic concentration.

SIDE EFFECTS AND PREPARATIONS: Occasional local reactions may occur at the injection site. Caution is advised in antibiotic-hypersensitive individuals, who should be tested for sensitivity.

DOSAGE: Injections of 0.5 ml., as compared with 1 ml. for the first fluid-type polio vaccine.

PREPARATION: Vaccine.

PACKAGING: Multiple dose vial containing 4.5 ml., enough for 9 doses.

SUPPLIER: Parke-Davis.

Tandearil

GENERIC AND CHEMICAL NAMES: Oxyphenbutazone; 1-phenyl-2-(p-hydroxyphenyl)-3,5-dioxo-4-n-butyl-pyrazolidine-monohydrate.

INDICATIONS: An analog of phenylbutazone possessing anti-inflammatory activity which apparently does not involve pituitary-adrenal function and does not impair immunity responses. Also shows analgesic and anti-pyretic activity but no significant urico-suric activity. Indicated for relief from rheumatoid arthritis and spondylitis, psoriatic arthritis, osteoarthritis, gout, painful shoulder, acute superficial thrombophlebitis, and other severe forms of a variety of local inflammatory conditions.

SIDE EFFECTS: Nausea, edema from sodium retention, and drug rash are observed more frequently. Agranulocytosis and thrombocytopenic purpura have occurred.

CONTRAINDICATIONS: Presence of edema, in cases of danger of cardiac decompensation, history or symptoms of peptic ulcer, presence of renal, hepatic or cardiac damage, history of drug allergy and blood dyscrasia, and patients receiving other potent chemotherapeutic agents which may increase possibility of toxic reactions.

DOSAGE: Patients should not exceed the recommended dosage since it may lead to toxic effects. The drug should be taken immediately after food or with a full glass of milk.

For chronic inflammatory conditions: initial adult dose ranges from 300 to 600 mg. divided into three or four equal doses for a time period of one week; maintenance dose should not exceed 400 mg. per day because of possible cumulative toxic effects and should be kept to the minimum effective level.

For acute gouty arthritis: initial dose of 400 mg. followed by 100 mg. every four hours until articular inflammation subsides, usually within four days; should not be continued beyond a one week period. For acute superficial thrombophlebitis: 600 mg. per day in divided doses for the first 2 or 3 days, followed by a reduction to 300 mg. daily; usual duration of treatment is 5 to 7 days and rarely beyond 10 days.

For other severe local inflammatory conditions: 400 to 600 mg. daily in divided doses for the first 2 or 3 days and subsequent doses of 300 mg. daily; therapeutic results usually achieved within 2 to 7 days.

PREPARATION: Tablets, round, tan and sugar coated, containing 10 mg. oxyphenbutazone.

PACKAGING: Bottles of 100 and 1000.

SUPPLIER: Geigy Pharmaceuticals.

Velban

GENERIC NAME: Vinblastine sulfate.

CHEMICAL COMPOSITION: Alkaloid extracted from the periwinkle, *Vinca rosea* Linn. Exact structure remains to be determined, but empirical formula is $C_{46}H_{58}O_9N_4$.

INDICATIONS: Indicated for treatment of generalized Hodgkin's disease, especially those cases unsuitable for or non-respondent to surgical or radiotherapeutic treatment. Also for choriocarcinoma resistant to other available therapy. Not yet recommended for treatment of other neoplastic diseases.

SIDE EFFECTS: Side effects seem to be related to the size of dosage employed. Among 176 patients treated, the side effects in the order of decreasing incidence were nausea, epilation, temporary mental depression, vomiting, malaise, paresthesia, phlebitis, temporary loss of deep-tendon reflexes, anorexia, and diarrhea. Nausea and vomiting were controlled by antiemetic agents. When epilation occurred, it frequently was not total; in several cases, hair regrew during therapy. In no cases did the drug have to be discontinued because of side effects among the patients treated.

HEMATOLOGICAL RESPONSE: Leukopenia is not permanent and returns to normal levels. Therefore, this response is the most important guide to dosage. The larger the dose employed, the more profound and longer lasting the leukopenia will be. For this reason, therapy should be initiated with a small dose and thereafter WBC counts be made daily or at least three times weekly to gauge the patient's leukopenic response. Doses repeated more frequently than every seven days appear to have an undesirable leukopenic effect. Following an adequate course of therapy, the average time for the cycle of leukopenia and return of the WBC count to normal levels is about two weeks. Following a smaller and more frequent dose for maintenance therapy, the cycle is complete within one week; and, in many cases, single small maintenance doses at intervals of seven to fourteen days may cause hardly any leukopenia. The effect on thrombocyte and red-cell count and hemoglobin is usually insignificant when other therapy, such as radiation and anti-neoplastic agents, does not complicate the picture.

PRECAUTIONS: Older patients, particularly those over 65 years of age, respond with more profound leukopenia than younger patients. For this reason, the initial dose in older patients should be no larger than 0.1 mg./Kg., and subsequent dosage increments should be made with caution. If leukopenia with less than 200 WBC/cu. mm. occurs, the patient should be watched carefully for evidence of infection. The use of vinblastine sulfate should be avoided in older patients suffering from cachexia or areas of ulceration of the skin surface. It is also inadvisable in patients with malignant-cell infiltration of the bone marrow. The use of small doses daily for long periods is not advisable, even though the total weekly dosage is similar to that recommended. Strict adherence to the recommended dosage schedule is very important.

CONTRAINDICATIONS: Patients must not receive the drug unless the WBC count is at least 4,000/cu. mm. The presence of bacterial infection contraindicates its use and must be brought under control prior to initiation of dosage.

DOSAGE: The dose, calculated to provide the desired mg./Kg. of patient weight, may be injected into the tubing of an intravenous infusion of five percent glucose in water. After injection of the drug, it is advisable to continue giving the glucose solution for several minutes to insure that the drug is washed up the vein into the general circulation. If leakage into surrounding tissues should occur, the solution will cause considerable irritation and should be discontinued immediately, and any remaining portion of the dose should then be introduced into another vein. Local injection of hyaluronidase and the application of moderate heat to the area of leakage help to disperse the drug and are thought to minimize discomfort and possibility of cellulitis. For complete information on the dosage schedule, see enclosure in package.

PREPARATION: Sterile ampuls, each containing 10 mg. of the drug in the form of a lyophilized plug. The ampuls should be stored in a refrigerator to assure extended stability. (To make a clear solution containing 1 mg. vinblastine sulfate per ml., add 10 ml. of sterile water or physiological saline to 10 mg. of the drug. Unused portions of the solution should be stored in the refrigerator, but for no longer than two weeks.)

PACKAGING: Sterile ampuls.

SUPPLIER: Eli Lilly and Company.

CONTROL OF POISONINGS

edited by **ALBERT L. PICCHIONI,** *Director, Arizona Poisoning Control Program*

Use of Triiodothyronine (T-3) in the Treatment of Acute Barbiturate Poisoning

► DURING THE PAST TWO YEARS A number of telephone inquiries have been received at the Arizona Poisoning Control Information Center concerning the efficacy of the thyroid hormone triiodothyronine (T-3) in the treatment of barbiturate poisoning. The majority of these telephone inquiries apparently stemmed from a newspaper article[1] describing the use of triiodothyronine in counteracting a lethal overdose of barbiturates. The article concluded that "in the absence of an artificial kidney which generally has been used in extreme cases of barbiturate toxicity, T-3 appears to be one of the best therapeutic remedies found thus far." Also, during this period, the Arizona Poisoning Control Information Center received reports concerning two cases of barbiturate poisoning which were treated with the intravenous injection of triiodothyronine and one case which was treated with the intravenous injection of thyroxin. It was impossible to assess the efficacy of the thyroid hormones in reversing the central nervous system depression caused by acute barbiturate intoxication in these cases, since various combinations of analeptic agents, such as bemegride, Metrazol, and caffeine and sodium benzoate, were also employed.

Since a search of the medical literature revealed no clinical reports or experimental studies on the use of triiodothyronine as a barbiturate antagonist, the Arizona Poisoning Control Information Center was prompted to conduct preliminary animal studies on the effect of the thyroid hormone on barbiturate-treated mice. These experimental studies consisted of determining the effect of triiodothyronine on the sleeping time of barbiturate-anesthetized mice, a test which has been employed by other investigators for evaluating the antidotal efficacy of analeptics in barbiturate-treated animals.[2,3] For example, Shaw and co-workers have shown that the analeptic agent, bemegride (100 mg./Kg.), when injected into mice and rats treated with pentobarbital (60 mg./Kg.), caused a 50 percent reduction in sleeping time of these animals.[2]

In the present studies male albino Swiss mice of the Webster strain, weighing between 14 and 23 grams, were divided into test groups and control groups of 10 animals each. All animals were injected intraperitoneally with an hypnotic dose (80 mg./Kg.) of sodium pentobarbital. As the righting reflex was lost, each mouse was then injected intravenously with either a triiodothyronine solution or the requisite volume of normal saline solution. Each group of test animals received one of eight dose levels of sodium liothyronine (sodium L-triiodothyronine)* consisting of 10 mcg./Kg., 100 mcg./Kg., 1 mg./Kg., 10 mg./Kg., 25 mg./Kg., 50 mg./Kg., 150 mg./Kg., or 250 mg./Kg. The sodium liothyronine solutions were prepared such that 10 ml./Kg. of the solution contained the appropriate dosage. The normal saline solution received by the control animals was adjusted to the same *p*H as the triiodothyronine solutions. The time interval between loss and recovery of the righting reflex was taken as the sleeping time.

The result of the present experimental studies was negative. The test animals not only failed to exhibit a reduction in sleeping time, but in the higher dosage levels they actually exhibited an *increase* in sleeping time. The increased sleeping time ranged from 15 percent in the mice treated with 10 mg./Kg. of triiodothyronine to 49 percent in the mice treated with 250 mg./Kg. of triiodothyronine. Since the oxygen consumption of tissues from thyroid hormone-treated animals is reported to be greatly accelerated,[4] it is tempting to speculate that this factor may be involved in the prolongation of sleeping time in the barbiturate-poisoned animals treated with high dose levels of triiodothyronine. These studies would seem to suggest that the use of triiodothyronine for the treatment of acute barbiturate (and other central nervous system depressant) poisoning should be avoided, if not contraindicated.

On the basis of the above preliminary animal studies and in view of the absence of controlled clinical studies, the Arizona Poisoning Control Information Center does not recommend the use of the thyroid hormones, triiodothyronine and thyroxin, in the treatment of acute barbiturate poisoning.

*Grateful acknowledgement is made to Smith Kline & French Laboratories, Philadelphia, Pa., for the sodium liothyronine (Cytomel) used in this study. Sodium liothyronine was dissolved in 0.01 N sodium hydroxide in saline solution according to the method of Murphy *et al.*[5]

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Treatment of Organic Phosphate Insecticide Poisoning with 2-Pyridine Aldoxime (2-PAM)

► IN A RECENT PUBLICATION, Funckes[1] reported a case of severe parathion poisoning. The victim, a 29-year-old man, worked for an aerial cropdusting service. His fellow employees had observed that he was habitually disregardful of recommended safety precautions in handling parathion. He did not take daily showers following exposure and he frequently smoked and ate without washing his hands after handling the insecticide. The sustained daily exposures to the chemical ultimately resulted in overt signs of organic phosphate insecticide poisoning. The symptoms of parathion poisoning exhibited by the victim were typical of extreme cholinesterase inhibition, namely, dizziness, nausea and vomiting, pinpoint pupils, profuse perspiration, excessive salivation, moist respiration, clonic convulsions, incontinence, disorientation, hypertension (220/110), and rapid and irregular pulse. Over a period of about 5 hours, the patient was given approximately 7.5 mg. of atropine by various routes of administration without apparent benefit. At the end of this time, because of the critical condition of the patient, 2-pyridine aldoxime methoiodide (2-PAM) was administered. One gram of 2-PAM in 20 ml. of saline was added to 500 ml. of 0.2 percent saline and infused intravenously. A significant improvement was observed within 10 minutes. The patient became rational, convulsions ceased, and the excessive salivation and perspiration stopped. An additional dose of 2 mg. of atropine was then injected intravenously. For the next 8 hours, the patient was given 1/150 grain (0.4 mg.) of atropine by mouth every hour; thereafter, 1/150 grain of atropine was administered every 4 hours for the next 2 days. Phenobarbital was given for restlessness. Five days after admission to the hospital, the patient was asymptomatic and was discharged; his blood cholinesterase values were rising. One week after discharge his cholinesterase values were within the normal range.

Recently, the chloride salt of 2-PAM has been made available for investigational use to physicians and research workers in the field of biochemistry and pharmacology.[2] This compound, 2-pyridine aldoxime methochloride has been given the generic name, pralidoxime chloride, and the trade name, Protopam Chloride. At the present time, Protopam Chloride is available by direct order only to Campbell Pharmaceuticals, Inc., 121 East 24th Street, New York 10, N.Y. The initial order for this drug should be submitted on a special form available from Campbell Pharmaceuticals, Inc. Protopam Chloride is supplied in sterile vials containing 1 gram of the dry powder which is stable indefinitely when stored at room temperature in the dark.[2] A 5 percent sterile aqueous solution of the preparation is made immediately before use. Although most of the past investigational work with 2-PAM has been carried out with iodide salt, the presently available chloride salt should prove advantageous, since it is more water soluble. One gram of the chloride salt is pharmacologically equivalent to 1.5 grams of the iodide salt.[2]

2-Pyridine aldoxime (2-PAM) is considered by most investigators only as an adjunct to adequate atropinization in the treatment of organic phosphate insecticide poisoning. Perhaps the most important application of 2-PAM as an antidote in the treatment of this condition is to alleviate muscular weakness, especially of the muscles of respiration.[3,4,5]

The following treatment for organic phosphate insecticide poisoning has been recommended:[2-5]

1. *Termination of exposure:* Remove clothing. Wash contaminated skin with water. Wash eyes with physiological saline solution or water. Perform gastric lavage if ingestion has occurred.

2. *Removal of secretions and maintenance of patent airway*: Place patient in prone position with head down and to one side, mandible elevated, and tongue pulled forward; clear mouth and pharynx with finger or suction. Use oropharyngeal of naso-pharyngeal airway if patient is unconscious or flaccid. Endotracheal intubation may be necessary if airway obstruction persists.

3. *Artificial respiration when necessary:* Use a positive pressure method because of restricted airway.

4. *Administration of atropine:* In severe poisoning, inject 2 mg. intravenously every 5 minutes until muscarine-like symptoms disappear and whenever they reappear; a total of 24 of 48 mg. may be required the first day. Adequate dosage is most important. The maximum safe dose of atropine is much larger than is generally realized, and one of the characteristics of organic phosphate insecticide poisoning is an increased tolerance to atropine.[6] In moderately severe intoxication, administer 2 mg. of atropine intravenously or intramuscularly, every 20 minutes until muscarine-like symptoms disappear; then maintain mild atropinization for 1 to

2 days. Dosage for children should be in proportion to body weight.

5. *Administration of 2-pyridine aldoxime methochloride (Protopam Chloride):* In severe intoxication, inject an initial dose of 1000 mg. intravenously at a rate not in excess of 500 mg. per minute. Administer a second dose of 500 mg. intravenously after about 30 minutes if muscle weakness is not relieved or recurs. In moderately severe intoxication, give an initial dose of 500 mg. and repeat as above. If intravenous administration is not feasible, intramuscular or subcutaneous injection may be used.

6. *Alleviation of convulsions if these interfere with respiration:* Administer intravenously an ultra short-acting barbiturate, such as thiopental sodium (2.5 percent solution).

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Hazards of Intentional Inhalation of Plastic Cement Fumes

► THE ARIZONA POISONING CONTROL INFORMATION center at The University of Arizona College of Pharmacy recently received a number of disturbing reports regarding the intentional inhalation of plastic cement by teenagers in this state. For example, since July 1, 1960, the Phoenix Police Department recorded processing 11 juveniles who were under the influence of plastic cement vapor. The Police Department in Tucson has a record of 1 teenager who was involved in the inhalation of plastic cement fumes and who also admitted knowledge of several schoolmates who practiced this undesirable fad. A Tucson physician reported to this office that he was treating a young girl for the effects of plastic cement sniffing and indicated that he had information about almost a score of other youths who participated in this type of practice. Although it is impossible to determine the prevalence of this dangerous fad, the incidence of intentional inhalation of plastic cement vapor is, undoubtedly, great enough to be of grave concern to law enforcement officials and medical practitioners. In the area of law enforcement, for instance, a youth intoxicated by the fumes from plastic cement would be no less a menace behind the wheel of an automobile than if he were driving while under the influence of alcohol.

The cases reported to the Arizona Poisoning Control Information Center have mainly involved the use of a plastic cement which contains toluene as the solvent. Toluene is an aromatic hydrocarbon compound and is chemically related to xylene and benzene. The inhalation of toluene (or its congeners) may result in a transient euphoria, in addition to other symptoms such as headache, giddiness, vertigo, ataxia, and tinnitus. It may also cause a mild macrocytic anemia. Although the lethal dose of inhaled toluene is unknown, the mean lethal dose of benzene is estimated to be about 15 ml. (approximately ½ fluid ounce) by mouth. Confusion, stupefaction, and coma (accompanied by tremors, motor restlessness, hypertonus, jactitations and generally hyperative reflexes) are the more severe symptoms of intoxication induced by aromatic hydrocarbon compounds. Since these solvents are potentially capable of sensitizing the heart to epinephrine, death may occur as the result of sudden ventricular fibrillation as well as from respiratory failure.[1]

Although other organic solvents employed in various types of plastic cement may possess no greater acute toxicity than toluene, they may, nevertheless, be disabling. Many of these solvents, such as ethylene dichloride and methyl cellosolve, are capable of causing fatal liver and/or kidney damage.

In view of the potentially serious consequences of intentional inhalation of plastic cement fumes, the Arizona Poisoning Control Information Center urges that parents, physicians, law enforcement officials, educators, etc., inform all youths of the hazards of plastic cement vapors and discourage the abuse of plastic cement.

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as the president sees it—

JACK S. HEARD, *St. Francis Memorial Hospital, San Francisco, California*

► THIS IS MY FIRST OPPORTUNITY to thank all of you —the general membership of the SOCIETY—for your confidence in electing me your president. My first reaction upon receiving the wire announcing the news was a feeling of heavy responsibility. That same feeling will probably stay with me until April, 1962. Like previous presidents of the SOCIETY I must balance my "SOCIETY time" against job and family responsibilities. But the impact of the demands of ASHP affairs has always motivated our officers to meet their obligations to the membership and I hope to be able to live up to the standards that have been set up for me.

An examination of the list of officers, committee chairmen and other members available to assist me in the coming year has bolstered my confidence in the prospects for the continued success of the SOCIETY in the coming year. In fact, my description of this wealth of talent as "assistants" is presumptuous; in reality the large number of *active, working* SOCIETY members is the backbone of the ASHP. The president should provide leadership and direction to these able and dedicated hospital pharmacists who themselves are leaders of our profession.

As is customary, my Inaugural Address at the Annual Meeting included plans for the forthcoming year. Since this address will be in green pages of the JOURNAL I will not repeat the same material here. It would be appropriate to share a few thoughts about our plans in this column. It is certainly apparent that most matters we discuss each year are not new, but are continuations (and in some cases, we hope, culminations) of projects started in previous years. After all, it would be sheer negligence if we did not continue to build on the work of the past. So we will continue to work on Internship Accreditation, Formulary System, Poison Control, Safety Practices and Procedures, etc.

Perhaps our newest and freshest approach will be Dr. Francke's "Commission on Goals for Hospital Pharmacy." Here we will attempt to re-define the professional aims of the SOCIETY and what hospital pharmacy is and should be. However, here again it must be remembered that any progress this committee makes will be built on the Audit of Pharmaceutical Service, the past work of the SOCIETY and, in a larger sense, the results of our practice of hospital pharmacy over the years.

Following approximately fifty specific recommendations resulting from the Audit findings, Dr. Francke suggested that the following four broad goals should be the focus of attention for hospital pharmacists during the next several decades:

1. Strengthen and expand (1) the scientific and professional aspects of the practice of hospital pharmacy, (2) the teaching role of the hospital pharmacist, and (3) his activities in the field of investigation and research.

2. Strengthen and perfect the administrative or management skills and tools essential to the hospital pharmacist in his role as a department head.

3. Attract a greater number of well trained pharmacists to hospital practice, including those with specialized education and training in hospital pharmacy.

4. Promote payment of realistic salaries to hospital pharmacists in both staff and managerial positions in order to attract and retain the services of career personnel.

On presentation, it was further suggested "that the SOCIETY study these goals, make such modifications or additions and deletions as are desirable and adopt by formal action appropriate goals for hospital pharmacy practice."

I am looking forward to the opportunity to visit some of the Affiliated Chapters during the coming year. It is my expectation that, to the extent of time and available funds, Vice-President Wolfe, Secretary Oddis, or I will be able to attend a good share of your seminars in various parts of the country.

As in the past few years, this page will become the Vice-President's page some of the time this year and Jerry Wolfe will have the chance to present his views and experiences to you. We hope to make good use of this means to communicate with you each month. All members should consider this a "two-way street" and send along any comments you might have.

JACK S. HEARD

News

Hospital Pharmacy Seminar at Wayne

Michigan hospital pharmacists heard four prominent pharmacists speak about the many facets of the hospital pharmacist at the Third Annual Hospital Pharmacy Seminar on March 23. The Seminar, sponsored by the Michigan Society of Hospital Pharmacists and Pfizer Laboratories of New York, was held at the McGregor Memorial Conference Center on Wayne State University's Campus.

Dr. Sereck H. Fox, professor of industrial pharmacy at Wayne's College of Pharmacy, opened the program by discussing the hospital pharmacist as a bulk compounder. He told the conferees that controls are essential to the hospital pharmacist who wishes to perform as a bulk compounder and should probably be stressed to an increasing extent in retail pharmacy.

Mr. Peter Solyom, Jr., administrative assistant of the University of Chicago Clinics, speaking on the hospital pharmacist as an administrator, said that this role involves: purchasing, personnel management, record keeping, and pricing.

"The hospital pharmacist, by virtue of his training and interest, is ideally suited to teach basic pharmacology to nurses in training in hospitals," said Mr. Henry J. Derewicz, instructor in pharmacology at Mercy Hospital School of Nursing in Pittsburgh, Pennsylvania.

Mr. Robert C. Johnson, field secretary of the Michigan State Pharmaceutical Association, reminded hospital pharmacists that the practice of hospital pharmacy is still a sub-specialty under the professional practice of pharmacy and that hospital pharmacists and their community counterparts should continually strive for common professional goals.

Following the four papers, a panel discussion on the implications of the new Food and Drug Administration regulations as they affect the practice of pharmacy was moderated by Mrs. Jane L. Rogan, president of the Michigan Society of Hospital Pharmacists.

The seminar was concluded by a banquet at which Dr. Leonard S. Rosenfeld, general director of the Metropolitan Hospital and Clinics, was guest speaker. Dr. Rosenfeld spoke on new trends in group practice. He indicated that the three principal concerns of members of the health professions are: (1) The scope and availability of health services, (2) The quality of services available, (3) The efficiency and economy under which health services are made available to the community.

Army Pharmaceutical Service Management Course Scheduled

Major problems confronting the commissioned pharmacist in the U. S. Army will be the chief topic discussed by a distinguished faculty at a pharmaceutical course to be conducted at Walter Reed Army Institute of Research May 22-26 in Washington, D. C.

Approximately 20 commissioned Army pharmacists from throughout the nation will attend the Army Pharmaceutical Service Management Course which will also offer them progressive guidance and the opportunity to exchange ideas.

Maj. Gen. Thomas J. Hartford, deputy surgeon general, and Brig. Gen. Robert E. Blount, director, professional service, Office of The Surgeon General, will deliver welcoming addresses at opening exercises. The course director is Lt. Col. Ralph D. Arnold, chief pharmacy consultant, Office of The Surgeon General.

Included among the military and civilian members of the faculty are representatives of the Office of The Surgeon General, National Institutes of Health, U. S. Public Health Service, American Pharmaceutical Association, and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS.

Featured speakers are Joseph A. Oddis, executive secretary, AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, who will speak on "Guiding Principles of the Hospital Formulary System;" Dr. George F. Archambault, pharmacy liaison officer to the Surgeon General, U. S. Public Health Service, whose subject is "The Law of Hospital Pharmacy;" and Col. Roy D. Maxwell, Medical Service Corps chief, Office of The Surgeon General, who will discuss "The Pharmacy Officer's Role in the Medical Service Corps."

Seven of the students attending the course will also double as faculty members. They are Maj. Kehan Jamkochian, Fitzsimons General Hospital, Denver, Colo.; Capt. A. Gordon Moore, U. S. Army Hospital, Ft. Ord, Calif.; Capt. Douglas J. Silvernale, Brooke General Hospital, and Lt. Thomas E. Arkinson, Medical Field Service School, both Ft. Sam Houston, Tex.; Capt. William J. Christopherson, Jr., Office of The Surgeon General; and Capt. Lewis C. Miner and Capt. James W. Stover, both of Walter Reed General Hospital. Capt. Stover is the course project officer. Students participating will include pharmacy officers from Army installations throughout the country.

History Institute Gains

The American Institute of the History of Pharmacy at its annual meeting in Chicago (April 25) reported about a forty percent gain in membership in the eight months since its last annual meeting in August 1960. Total membership now stands at about 1150 individual, institutional and supporting members, well over the goal of 1000 set by the Institute's members for the

organization's twentieth anniversary meeting this year. The increase amounts to approximately forty-five percent for Supporting Members (donors) and nearly forty percent for those holding the regular membership.

A.I.H.P. Secretary, Ernst W. Stieb, expressed "particular gratification that growing support for the Institute and its program comes from individual members of the profession as well as from pharmaceutical corporations. Looking back twenty years to the Institute's modest beginning in 1941," he continued, "such support validates the purposes for which the organization was founded, gives a reassuring vote of confidence in its present activities, and augurs well for its future growth and development."

Archambault Receives Honorary Degree at Temple

Dr. George F. Archambault, a past president of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS and chief of the Pharmacy Branch, Division of Hospitals, U. S. Public Health Service, was awarded an honorary degree at Temple University's Sixtieth Anniversary Convocation on March 23. At the same time, Dr. Albert B. Sabin, responsible for the Sabin live-virus polio vaccine, also received an honorary degree and delivered the principal address. Dr. Sabin is presently a Fellow at the Children's Hospital Research Foundation in Cincinnati, Ohio.

Dr. Archambault, well known to members of the ASHP, also serves as pharmacy liaison officer to the Surgeon General of the U. S. Public Health Service. He is currently serving as Chairman of the Council of the American Pharmaceutical Association.

► HUGH F. KABAT has recently accepted a teaching position at University of Minnesota College of Pharmacy, Minneapolis. Mr. Kabat is a graduate of the University of Michigan College of Pharmacy and holds a Masters Degree in Hospital Pharmacy from Michigan, including an internship in Hospital Pharmacy at University Hospital. He has recently completed studies leading to a Ph.D. at University of Colorado, Boulder.

Awards for P.H.S. Pharmacists at Kentucky Meeting

► AN AWARD of fifty dollars was presented by the Clinical Society of the U. S. Public Health Service for the best paper presented by pharmacists at the annual meeting at the Lexington, Kentucky U. S. Public Health Service Hospital April 5 to 8. The winning papers tying for the prize were "Stability of Isoproterenol Hydrochloride Solution with Tylosopol" by pharmacists R. J. McGarry and J. Resko of New Orleans U. S. Public Health Service Hospital and "Tests for Identification and Dilution of Meperidine Hydrochloride in Expended Multiple Dose Vials" by pharmacists C. A. Branagen, Jr. and M. D. Dooley of Staten Island U. S. Public Health Service Hospital. The papers were presented in competition by Junior Public Health Service Pharmacists at the Pharmacy Sessions. The awards were presented by Surgeon-General Terry at a dinner on Friday evening, April 7, at the Phoenix Hotel.

Guest chairmen of the Pharmacy Sessions were Paul Parker, director of pharmacy services, University of Kentucky Medical Center, Lexington, and Earl Slone, dean of the College of Pharmacy, University of Kentucky.

An unscheduled paper of interest was "Some Aspects of Pharmacy Practice in Germany" by Dr. Hans Friebel, pharmacist and physician, and at present professor of pharmacology at University of Bonn, Germany.

The Clinical Society is an organization of Medical, Dental and Pharmacy Officers of the U. S. Public Health Service devoted to the improvement of clinical practice and research in hospitals and clinics. Pharmacists presenting papers at this meeting were from the hospitals in the Division of Hospitals and the Division of Indian Health.

The next meeting of the Clinical Society will be held in the spring of 1962 at the National Institutes of Health, Bethesda, Maryland.

► THE NEW ENGLAND COUNCIL of Hospital Pharmacists will meet at the Massachusetts College of Pharmacy in Boston on May 23 and 24. Hospital pharmacists from throughout the New England States participate in this meeting with official representation from the various ASHP Affiliated Chapters.

► DR. LOUIS W. BUSSE, associate dean, University of Wisconsin School of Pharmacy, has been invited to lecture at the University of London (England) School of Pharmacy during the 1961 spring term. Before his return to the United States, he also plans to visit several countries on the European continent, to attend pharmaceutical conferences, to visit schools of pharmacy and pharmaceutical manufacturers, and generally to observe the practice of pharmacy and pharmaceutical education.

► Dr. Irwin Siegel has recently been appointed Deputy Medical Director of the Food and Drug Administration. Prior to the new appointment, Dr. Siegel was associate director of the New Drug Branch of the Bureau of Medicine.

Serving under Dr. William H. Kessenich, the medical director, Dr. Siegel will help direct the staff of physicians and veterinary medical officers of the

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bureau which develops the medical policy of FDA with respect to the therapeutic efficacy and safety for men and animals of drugs, devices and cosmetics. It also passes on the safety of new drugs before they are allowed on the market, and prepares the medical aspects of court cases brought in the enforcement of the Federal Food, Drug and Cosmetic Act.

► GILBERT I. SIMON has been named Director of Pharmacy Service at the Lenox Hill Hospital in New York City. Mr. Simon has had previous experience at Lenox Hill Hospital and is a graduate of Fordham University College of Pharmacy.

► GEORGE F. ARCHAMBAULT, pharmacy liaison officer to the Surgeon General and chief, Pharmacy Branch, Division of Hospitals, U. S. Public Health Service, Washington, D. C., participated in an Institute on Hospital Law held in Austin, Texas on March 6-8. The Institute was conducted by the American Hospital Association in cooperation with the Texas Hospital Association.

Subjects covered by Dr. Archambault included a discussion on "Law of Hospital Pharmacy," and "The Hospital Formulary System."

B-D Offers Comprehensive Series on Sterilization

A comprehensive booklet containing eight authoritative articles on the subject of sterilization procedures and controls is being distributed by Becton, Dickinson and Company.

The 123-page booklet is a compilation of the Becton, Dickinson Lectures on Sterilization presented as part of the curriculum in bacteriology at Seton Hall University College of Medicine and Dentistry. Lecture topics were the problems of sterilizing surgical equipment, heat, gaseous and chemical sterilization methods, the control of cross infection, skin antisepsis, new horizons in sterilization and the control of sterilization procedures.

The booklet is now being sent, as a service by B-D, to hospital administrators and other personnel concerned with sterilization, to medical schools and to schools of hospital administration. Additional copies are available and will be sent on request by writing to Becton, Dickinson and Company, Rutherford, N. J.

Publication of the booklet is particularly important at this time, according to Mr. W. S. Little, vice president for sales, "because the trend toward sterile, disposable medical equipment has transferred more and more responsibility for sterilization from the user to the producer. Thus it becomes important for physicians and hospital personnel to be familiar with the latest technics in order to evaluate the various methods applied by manufacturers."

SELECTED PHARMACEUTICAL ABSTRACTS

and summaries of other articles interesting to hospital pharmacists

edited by NORMAN HO

FACTORS IN ACCURACY

Accuracy and Error in the Lab—Part 2: Factors in Accuracy, Myers, E. E., Hosp. Topics 39:109, (Feb.) 1961 (Myers Clinic and Broaddus Hospital, Philippi, W. Va.)

This article presents and evaluates some of the factors that influence accuracy in the laboratory. Some of the factors presented are: (1) Arrangement: space, efficiency, and noise. It is stated in the article that efficiency is closely related to accuracy and that careful study should be made to provide maximum working efficiency. Noise and distraction should be minimum, since they prevent concentration and contribute to error. Optimum lighting will help avoid the fatigue due to eye strain, and will otherwise promote efficiency. (2) Scientific atmosphere; supervision, direction, rules and regulations, library, conferences, and morale. Good morale is probably the most important in good, accurate, dependable laboratory work. (3) Individual qualities of the technologists: native ability, education, experience, technical skill, attitudes, working speed, carefulness, attention to detail, habits, physical characteristics, psychological factors. (4) Obtainable accuracy; inherent or unavoidable errors, significant figures. (5) Desired accuracy: accuracy necessary or desirable. (6) Selection of tests and technics: person doing test, technic manuals, new tests. (7) Materials, chemicals, and reagents: source, quality, storage, deterioration. (8) Equipment and apparatus: selection of, cost, sensitivity, calibration, care in use, maintenance. (9) Environment: temperature, barometric pressure, humidity, contamination. (10) Clerical: labeling, recording, writing and copying of reports, involvement of other hospital departments. (11) Controls: standards, statistical control, duplicate analysis, two-person check, and two sources of materials check.

LAWRENCE J. RASERO, JR.

PARTICLE MEASUREMENT IN SOLUTIONS

A Method of Measuring Matter Suspended in Liquids, Hudson, H. E., Pharm. J. (Great Britain) 186:201 (Mar. 11) 1961. (Imperial Chemical Industries Ltd., Alderly Park, Macclesfield, Cheshire.)

An analytical instrument suitable for the examination of suspensions containing only a few parts per million of insoluble matter is described. Basically it is a nephelometer using a different arrangement of components and with modifications of these components to increase sensitivity. The light source is a 30 watt, 6 volt filament lamp. The beam is directed through a condensing lens to the base of the cylindrical glass sample cell. The sample cell base is optically flat. The sample cell compartment has a highly polished metal reflecting surface which directs the maximum amount of the reflected light to a photomultiplier tube having a photo-current amplification of 200,000 times. The current flows to a microammeter. Included in the circuit is a backing off potential for the setting of a "zero" with a control solution.

The sensitivity and accuracy of the instrument was measured with kaolin particles in suspension. Suspensions containing less than 2 p.p.m. gave microammeter readings which were reproducible within 10%. Some suggested applications of this instrument are in the control of extraneous matter in injections, detection of trace decomposition and quantitative examinations of trace impurities by conversion of the latter to insoluble forms under standard conditions. A modification is suggested whereby injections in ampuls might be examined.

LEONARD C. SISK

TECHNOLOGY OF MINERAL OILS

New Technology of White Mineral Oils, Franks, A. J., Am. Perfumer Arom. 76:23 (Feb.) 1961. (Pennsylvania Refining Co.)

"White mineral oils" are produced by the drastic sulfonation of selected petroleum fractions for the removal of aromatic, unsaturated and other reactive hydrocarbons, as well as minor amounts of sulfur, oxygen and nitrogen derivatives which may be present. "Technical white oils" either are not so drastically treated as the better grades or fail in one or more respects to comply with all N.F. or U.S.P. requirements. Whereas the previous U.S.P. and N.F. only allowed a maximum of 10 p.p.m. alpha tocopherol, the U.S.P. XV and N.F. XI allow any "suitable stabilizer." Although it is known that the oils are composed entirely of saturated hydrocarbons, their exact composition is still very complex and unknown. It is thought that the number of isomers in the "parafin" and "naphthene" series run into thousands of individual compounds. For the purpose of comparisons Waterman has devised a useful system whereby their molecular weights, the percentages of carbon atoms which occur in naphthene rings and the number of such rings may be computed from data on the refractive index, density, and viscosity of white oils. Technical oils which are not fully refined to meet the U.S.P. acid test, fail to show acceptable stability to light, heat and readily develop unpleasant, objectionable odors and taste during exposure. Because of the carcinogenic history of some poorly refined petroleum oils referred to in older medical literature, misconceptions still persist. However, medicinal white oils have so consistently been shown to be free of carcinogenic activity that they are often used as solvents and control material in cancer investigations. Although white oils will not penetrate normal skin, it can be absorbed by dry skin in appreciable amounts. It has been found that formulations containing the lower viscosity oils are more acceptable to the consumer because of the freedom from the sensation of greasiness.

FRANZ W. GEISZ

SOLUBILIZATION OF VITAMINS A AND D

Studies on Pharmaceutical Preparations. XI. Solubilization of Vitamins A and D. (7). Vicosity of Aqueous Solution Solubilized with Sucrose Monoesters, Mima, H. and Kato, M., J. Pharm. Soc. Japan 81:32 (Jan.) 1961. (Research Laboratories, Takeda Chemical Industries, Ltd.).

Solubilization of vitamin A-alcohol, -acetate, and -palmitate, and ergocalciferol in water by mixing with sucrose monomyristate results in different viscosity of the solubilized solution according to the kind of solubilizates when the ratio of sucrose myristate to water is kept constant and concentration of the solubilizates is varied. In vitamin A-alcohol and ergocalciferol, relative viscosity increases with increasing concentration until the solution becomes turbid and the viscosity then falls. On the other hand, viscosity of the solubilized solution hardly changes with increasing concentration of vitamin A-palmitate and -acetate. This phenomenon is assumed to be connected with polarity of the solubilizates. Viscosity of the solution in which lauryl alcohol has been solubilized is similar to the former and that of cetane is similar to the latter. The fact that the viscosity of a solution in which polar substance has been solubilized shows a maximum at a certain concentration of the solubilizate has already been observed in other surface-active agents and the foregoing phenomenon is assumed to be related to the structure of solubilized micelle formed by sucrose myristate and the substance to be dissolved.

AUTHOR'S SUMMARY

SOLUBILIZATION OF VITAMINS A AND D

Studies on Pharmaceutical Preparations. XII. Solubilization of Vitamins A and D. (8). Solubilization with Raffinose Fatty Acid Esters, Mima, H., Kato, M., and Yotsuzuka, M., J. Pharm. Soc. Japan 81:37 (Jan.) 1961. (Research Laboratories, Takeda Chemical Industries, Ltd.).

In order to solubilize vitamins A and D for fortification of foodstuff, substances which are allowed for use in foodstuff, such as sucrose ester, must be used as a solubilizing agent. However, some of sucrose esters suited for solubilization have unpleasant odor or taste and their use is limited. In order to improve this point, raffinose esters were prepared, and their properties and solubilization power were examined. Raffinose palmitate, oleate, and myristate are practically odorless and tasteless, dissolve well in water, and are able to solubilize vitamins A and D to form a transparent solution, thereby showing that they have solubilization power equal to the known solubilizing agents such as Tweens. Oral and parenteral toxicity of these raffinose esters showed that the former is very small and their possible use for foodstuff was suggested. However, these esters were fairly toxic by intravenous injection and this was assumed to be due

to their hemolytic action, same as that of sucrose esters. Aqueous solution of vitamins A and D solubilized with raffinose ester is stable and does not become cloudy on heating.

AUTHOR'S SUMMARY

ANTIBACTERIAL ACTIVITY OF AROMATIC CHEMICALS

How Vapors of Aromatic Chemicals Affect Bacteria, Maruzzella, J. C., Garofalo, M. M., and Chiaramonte, J. S., Am. Perfumer Arom. 76:35 (Feb.) 1961. (Long Island University, Biology Department, Brooklyn, N. Y.)

This laboratory had conducted investigations in the past showing that some perfume oils or their vapors will destroy microorganisms. The present investigation is a preliminary screening of a variety of aromatic chemical vapors at full strength against Gram positive and Gram negative bacteria *in vitro*. 192 aromatic chemicals were tested. It was found that aromatic acids possess the highest percentage of antibacterial activity, followed by aldehydes, ketones, alcohols, and miscellaneous esters, ethers, acetals, and lactones. Vapors producing large zones of inhibition against all five test organisms were: heptaldehyde, nonyl aldehyde, iso-amyl formate, n-butyl propionate, ethyl caproate, ethyl propionate, ethyl isovalerate, heptyl formate, hexyl acetate, di-n-propyl ketone, and methyl heptenone.

FRANZ W. GEISZ

DETAIL MEN AND HOSPITAL PHARMACISTS

What Hospital Pharmacists Think of Detail Men, Teplitsky, B., Am. Profess. Pharmacist 27:29 (Feb.) 1961. (Pharmacy Service Veterans Administration.)

This national study of how drug detail personnel are viewed by hospital pharmacists was carried out in 1955 and again in 1960. Replies were received from 262 out of 400 hospitals in 1955 and from 286 of the same 400 in 1960. The questionnaires were sent to a sampling of chief pharmacists at Territorial, U.S.P.H.S., V.A. Regional, Armed Forces, Mental, General-Medical & Surgical, and V.A. hospitals, as well as to a small sample of hospitals representative of the A.S.H.P. The same fifteen questions were asked of both sets of sample members (1955 and 1960). The questions themselves are concerned primarily with how hospital pharmacists handle detail men in practice, and how great is the detail man's area of freedom in the hospital. One important finding shows that of those hospitals that schedule regular drug exhibits by detail men (57 per cent of all sample hospitals in 1960), only 57 per cent of *these* hospitals leave the scheduling of such exhibits to the pharmacy (1960). All questions with their replies are tabulated on one continuous table according to type of hospital for both 1955 and 1960. Other interesting data obtained by this survey are the ratios of hospital pharmacists to hospital beds which, for all sample hospitals in 1960 was one pharmacist per 320 beds as compared with one per 315 in 1955. The question of whether the same sample of hospitals was used in 1955 and 1960 is not clear to the reader and is relevant when comparing the two sets of results. The author concludes his informative study by saying that all detail men and hospital pharmacists should operate on a mutual consideration basis. He also points to the desirability of detail men conducting their drug exhibits, where authorized, in a professional manner and in conformance with all regulations. Hospital pharmacists are expected, in turn, to schedule such exhibits on an impartial basis, assuring equal numbers of exhibits and at equal intervals for all drug houses.

DAVID BURKHOLDER

INHIBITION OF AUTOXIDATION IN LANOLIN

Autoxidation, And Its Inhibition, In Anhydrous Lanolin, Clark E. W. and Kitchen, G. F., J. Pharm. Pharmacol. 13:172 (Mar.) 1961. (Westbrook Lanolin Company, Argonaut Works, Laisterdyke, Bradford 4, England).

Methods of inhibiting autoxidative degradation of anhydrous lanolin have been studied. It was found that there were differences in rates of oxidation between different types of crude wool fat, even though processes used in refining the lanolins had differed in only minor ways. Possible reasons cited were: (1) differences in content of trace elements, (2) variation in traces of phosphorus compounds, (3) existence of natural antoxidants in raw wool fat in variable quantities being carried through the refining processes into the finished lanolin, (4) the catalytic effect of peroxides already in the lanolin, (5) differences in previous history of the lanolins, and (6) differences in pH. It was found also that a complete absence of light does not prevent autoxidative increase in acid value. Tests were then carried out to find the efficiency of various antoxidants in preventing autoxidative degradation of anhydrous lanolin. Since the efficiencies of individual antoxidants were not linearly related in concentration no definite order of efficiency could be established. In general however, butylated hydroxyanisole (B.H.A.) was the most efficient single antoxidant, while butylated hydroxytoluene (B.H.T.) was almost as good. It was found that 100 ppm of B.H.A. could satisfactorily inhibit autoxidative degradation for at least 32 months under good conditions or 2 years under bad conditions.

LAWRENCE J. RASERO, JR.

SUSTAINED-ACTION RELEASE RATES

Evaluation of Sustained-Action Release Rates, Campbell, J. A., Drug & Cosmetic Ind. 87:620 (Nov.) 1960. (Food and Drug Laboratories, Department of National Health and Welfare, Ottawa, Canada).

Sustained-action preparations are gaining popularity among the medical professions. The Food and Drug Laboratories in Canada have been concerned with some of the claims made for these preparations. A sustained-release preparation is defined as one in which a single dose unit provides for a rapid initial establishment of response within a therapeutic range, and then maintains this level for some period of time of sufficient duration to make the use of this type of preparation advantageous. Sustained-release differs from delayed release, repeat action, timed disintegration and even prolonged release. *In vitro* tests can be meaningful for specific products if first standardized against adequate *in vivo* data. Three *in vivo* methods are outlined, i.e., clinical response, blood level data, and urinary excretion. Some 15 mg. sustained-release amphetamine preparations may vary from releasing all 15 mg. at once to only 5 mg. available over 24 hours. Some preparations contained the labeled amount of drug, however it was relatively unavailable to the body. A group of five sustained-release vitamins were tested and all were found to release riboflavin inadequately. Some compounds, such as riboflavin, were found to be best absorbed in the upper part of the intestine whereas acetylsalicylic acid was absorbed throughout the intestinal tract. It is clear that many sustained-release preparations on the market do not have sustained-release properties when evaluated by an adequate method. It is suggested that this form of medication be tested by adequately controlled *in vivo* tests, until *in vitro* tests can be standardized against the *in vivo* data.

FRANZ W. GEISZ

REMOVAL OF PYROGEN

Studies on the Removal of Pyrogen. IV. Mechanism of the Removal of Pyrogen by Quinone-Carbon Treatment, Matsumoto, S., J. Pharm. Soc. Japan 81:277 (Feb.) 1961. (Research Laboratory of Resources Utilization, Tokyo Institute of Technology, and Tokyo Research Laboratory, Tanabe Seiyaku Co., Ltd.).

Elucidation of the reaction mechanism of quinone-activated carbon treatment was attempted in order to establish fundamental conditions for complete elimination of pyrogen by such a treatment.

Reaction of pyrogen and quinone, and experiments on adsorption and desorption of the reaction product by activated carbon were carried out with ribonucleic acid, having similar nature to pyrogen, and pyrogenic sodium alginate injection as test samples. It was thereby revealed that pyrogen (P) and quinone (Q) formed a reversible compound (PQ) like a molecular compound at the initial stage of the reaction and that this compound changed into an irreversible compound PQ like a condensation compound. This was confirmed mainly through the adsorption-desorption curve of these compounds on activated carbon and a reaction sequence illustrated in Chart 1 was presumed.

AUTHOR'S SUMMARY

REMOVAL OF PYROGEN

Studies on the Removal of Pyrogen. V. The Actual Removal of Pyrogen in Various Drugs for Injection by Quinone-Carbon Treatment, Matsumoto, S., J. Pharm. Soc. Japan 81:282 (Feb.) 1961. (Research Laboratory of Resources Utilization, Tokyo Institute of Technology, and Tokyo Research Laboratory, Tanabe Seiyaku Co., Ltd.).

In accordance with the reaction mechanism for removal of pyrogen by quinone-activated carbon treatment described in the preceding report, examinations were made on the practical operational conditions for complete removal of pyrogen. Several injections of various substances containing pyrogen were submitted to the experiments under the conditions described below. In the quinone-treatment reaction, it is fundamentally essential

to have all the pyrogen (P) present in the sample form the irreversible compound, PQ. The conditions for this reaction are the finely pulverized α-naphthoquinone as the quinone, in approx. 0.3 g./100 cc. of the injection, the solution to be maintained at neutral or slightly alkaline, state, and the heating to be effected at 100° for 1—3 hours. Practical injection to be used as a sample for removal of pyrogen are glucose, pyrogenic glucose, fructose, invertose, Ringer solution, sodium alginate, dextran, and sodium citrate. Evaporated tap water was also used as a sample.

It was thereby found that this treatment was able to reduce pyrogen to the extent undetectable by the modified TBP coloration, i.e. below 0.25γ/cc., in all the samples examined in which the original content of pyrogen was 0.63—7.5 γ/cc. calculated as egg albumin.

AUTHOR'S SUMMARY

PAPER ELECTROPHORESIS FOR DETECTION OF IMPURITIES AND HEAVY METALS

Application of the Method of Paper Electrophoresis for the Detection of Impurities, of Heavy Metals, Contained in Pharmaceutical Preparations, Malysz, D., Acta. Pol. Pharm. 3:227 (Mar.) 1960.

The author attempts to make use of the paper electrophoresis method for detecting impurities, of heavy metals (Pb, Cu, Zn, Fe), in pharmaceutical preparations. In order to obtain a proper distribution of the components and as low a minimum of detection as possible, she investigated various electrolytes and developing reagents, and determined the conditions for the process of paper electrophoresis.

As electrolyte she chiefly used a solution of 0.86% sodium citrate and 0.39% citric acid.

For detecting the ions of: Pb, Zn, Cu, Fe, the author used the following solutions: rodisonic acid, ditizone, p-phenetidine, and sodium diethyldithiocarbamate.

She developed 2 methods of examination: one for ashless preparations, the other for preparations containing such metals as sodium and calcium. In the latter method the author made use of the method of joint precipitation of heavy metals in the presence of mercury salts, by means of hydrogen sulphide.

It is an easy matter to separate the obtained sulphides of heavy metals from the excess of calcium and sodium salts which both are obstacles in electrophoresis determination.

AUTHOR'S SUMMARY

STABILITY OF MORPHINE IN AQUEOUS SOLUTION

Stability of Morphine in Aqueous Solution III. Kinetics of Morphine Degradation in Aqueous Solution, Yeh, Shu-Yuan and Lach, J. L., Am. J. Pharm. Sci. 50:35 (Jan.) 1961. (State University of Iowa, College of Pharmacy, Iowa City.)

The degradation of morphine in aqueous solution is dependent on the pH of the solution and on the presence of atmospheric oxygen in the system. The overall reaction rate, in systems containing excess oxygen, was found to be equal to

$$\left[k_1' \left(\frac{Ka}{Ka + H^+}\right) + k_2' \left(\frac{H^+}{Ka + H^+}\right)\right](\text{Morphine})$$

Degradation mechanisms for morphine, based on kinetic data and previously reported data on naphthol oxidation, are presented.

AUTHOR'S SUMMARY

BIOFLAVONOIDS IN EXPERIMENTAL ULCERATION

Bioflavonoids in Experimental Ulceration, Vogin, E. E. and Rossi, V., Am. J. Pharm. Sci. 50:14 (Jan.) 1961. (Department of Pharmacology, Philadelphia College of Pharmacy and Science, Philadelphia 4, Pa.)

The bioflavonoid compounds—hesperidin methyl chalcone, orange bioflavonoid complex (OBC) D-2742, OBC 291-R-1, administered alone or in combination with ascorbic acid, were evaluated for antiulcer activity according to five different procedures for producing experimental ulcers: (I) depot histamine-induced gastric ulcers in the guinea pig, (II) reserpine-induced gastric ulcers in the seven and one-half hour pylorus ligated rat, (III) thermally induced serosal burn lesions in the rat stomach, (IV) ulcers induced by fifteen-hour pylorus ligation in the rat, and (V) gastric ulceration in the rat induced by repeated injections of reserpine. The combination of OBC 291-R-1 and ascorbic acid exhibited a greater trend than either agent alone in reducing the incidence of ulceration in procedure I. OBC 291-Y-1, ascorbic acid, and combinations of these two factors reduced the incidence of ulceration in procedure II. Neither the bioflavonoid compounds nor ascorbic acid alone or in combination were effective in reducing the degree of ulceration in the other three experimental procedures.

TOXICITY TESTING OF DISPOSABLE TYPE EQUIPMENT

The Toxicity and Safety Testing of Disposable Medical and Pharmaceutical Materials, Brewer, John H. and Harold H. Bryant, J. Am. Pharm. Assoc., Sci. Ed. 49:652 (Oct.) 1960. (Biological Research Laboratories, Hynson, Westcott and Dunning, Inc., Baltimore, Md., for Becton, Dickinson Company, Rutherford, N. J.)

Many disposable surgical and pharmaceutical materials are not adequately tested for their toxicity or compatibility with tissues. Everyday the demand increases for disposable, ready-to-use materials. Syringes, needles, vials, catheters, drain tubes, and countless other items of this type are now available and their advantages cannot be denied. The U.S.P. has certain sterility and toxicity requirements for plastic tubing assemblies to be used in blood collection and transfusion. No requirements are outlined by either the U.S.P. or F.D.A. for tubing to be used for drains or indwelling catheters.

In this study, plastic tubing was tested by imbedding samples in animals and, some types were found to cause tissue reaction and necrosis that is open to bacterial infection. Also, certain aluminum type disposable needles were found to form a flocculent precipitate upon contact with normal saline. Upon intravenous injection into mice, this flocculence was presumed to be the cause of embolism and sudden death of the test animals.

It is emphasized that the purpose of the paper is to stimulate the hospital pharmacist or the hospital purchasing agent to be certain that adequate sterility and toxicity testing has been performed on disposable type items and that these items are satisfactory for the purpose for which they are to be employed, before giving an order for the same.

AL CURTIS

CURRENT LITERATURE

. . . also calling your attention to the following articles appearing in recent hospital and pharmaceutical journals

. . . . . .

ADMINISTRATION

—General

Heller, William M.: Annual Administrative Reviews—Pharmacy, *Hospitals* 35:143 (Apr. 16) 1961.

—Purchasing

Littlewood, S. D.: The Purchase of Surgical Dressings, *Public Pharmacist* (Great Britain) 18:75 (Apr.) 1961.

AMERICAN SOCIETY OF HOSPITAL PHARMACISTS
(Includes ASHP Affiliates)

Vance, Joe: Convention Highlights Busy Month (Program of Southeastern Society of Hospital Pharmacists) *South. Hosp.* 29:53 (Apr.) 1961.

FLOOR PLANS AND PLANNING

Hopkins, S. J.: Planning and Organization of a Central Supply Department, *Public Pharmacist* (Great Britain) 18:78 (Apr.) 1961.

PHARMACY AND THERAPEUTICS COMMITTEE
(Includes Formularies)

Letourneau, Charles U.: The Hospital Drug Formulary (Part I—The Pharmacy Committee; Exceptions to the Formulary; Right to Prescribe; Lack of Formulary; Large Hospital Problems). *Hosp. Management* 91:38 (Apr.) 1961.

Letourneau, Charles U.: Hospital Drug Formulary (Part II—The Statement of Guiding Principles on the Operation of the Hospital Formulary of the American Hospital Association) *Hosp. Management* 91:31 (May) 1961.

DRUG EVALUATIONS

by the Council on Drugs of the American Medical Association

► DRUG EVALUATIONS as published by the Council on Drugs of the American Medical Association have been reprinted in the AMERICAN JOURNAL OF HOSPITAL PHARMACY regularly. In accordance with an editorial in the December 17 (1960) issue of the *Journal of the American Medical Association 174*:2066, the column formerly known as "New and Nonofficial Drugs" has been replaced by a new column under the name "New Drugs and Developments in Therapeutics." In this, a digest of monographs and drug evaluations will appear.

The monographs will continue to be made available and will be cumulated to appear in the Council's annual publication, *New and Nonofficial Drugs*. For the information of hospital pharmacists, reports made available by the A.M.A.'s Council on Drugs will continue to be published in this column.

The Index included in the February issue of THIS JOURNAL contained reference to those drugs published in the *Journal of the American Medical Association* between October 24, 1959 and December 17, 1960. These monographs were reprinted in THIS JOURNAL between February 1960 and January 1961. All appear in *New and Nonofficial Drugs 1961*, which is now available from either your local book store or from the publishers, J. B. Lippincott Company, Philadelphia, Pa. This makes up the annual compilation of available information on drugs, including their therapeutic, prophylactic and diagnostic status, as evaluated by the Council on Drugs of the American Medical Association.

For the convenience of readers of THIS JOURNAL, a listing of the monographs added to N.N.D. 1961 as well as the monographs omitted from N.N.D. were listed in the March issue of THIS JOURNAL. With that issue, publication of the new series was also started.

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COUNCIL ON DRUGS

A Council on Drugs' Digest

New Drugs and Developments in Therapeutics

Current Status of Therapy of the Menopause

A Discussion of the Therapeutic Problems at Time of Cessation of the Menses and Management of the Post-Menopausal State

JOSEPH ROGERS, M.D., BOSTON

► THE RAPID INCREASE in life expectancy of women and the increasing proportion of older persons in the population have stimulated increased attention to the proper management of the menopause. It seems appropriate to discuss not only the therapeutic problems arising at the time of cessation of the menses but also the management of the post-menopausal state.

The fundamental change at the menopause is a decreasing frequency of ovulation followed later by a decline in estrogen production by the ovary. These events are reflected clinically by a change in the menses which may consist of sudden cessation of normal periods, irregular and profuse menstruation, or scanty and infrequent periods. Eventually permanent amenorrhea ensues. The other classic symptom of the menopause is the hot flash, which is usually described as a sudden sensation of heat in the face, neck, and chest associated with diffuse or patchy flushing of the skin, and perspiration. According to Albright[1] the hot flash is mediated by elevated gonadotropins and is not due primarily to hypoestrogenism. The observations of Reynolds and associates[2] indicate, however, that the hot flash may relate to the effects of estrogens in producing arteriolar dilation.

The menopause, defined simply as cessation of menstrual function, may occur between 40 and 55 years of age. The menopause is occurring at progressively later ages and now occurs, on an average, at the age of 49. Probably only about 10 to 15% of women will present themselves for advice concerning menopausal symptoms. With some notable exceptions,[3] it is generally agreed that the only symptoms of the menopause that are due to estrogen deficiency are the cessation of periods and vasomotor instability, as manifested by hot flashes. The numerous other symptoms such as palpitation, instability, insomnia, fatigue, and emotional instability seem clearly to be manifestations of the anxiety and depression that occur rather frequently in midlife but are related to the menopause only temporally. It is frequently this latter group of symptoms that produce the most distress and bring the patient to her physician.

From the Pratt Clinic-New England Center Hospital, and the Departments of Medicine and Gynecology, Tufts University School of Medicine.

Most Important Conflicts

The psychological conflicts of midlife have been thoroughly discussed previously.[4] The most important conflicts relate to a change in a woman's position in the family circle. The children develop interests outside the home and create in the middle-aged woman a feeling that she is no longer needed. She may have developed concepts that the loss of reproductive ability indicates also a loss of libido or that she will be a less attractive person to her husband.

Common erroneous ideas concerning the menopause may have been implanted by well-meaning friends, relatives, or even the physician. The occurrence of psychoneurotic symptoms during the menopause correlates with the patient's previous response to emotional problems. Several studies have shown that anxiety and depression can be related to previous emotional disorders uncovered or aggravated by situational stress occurring during the menopause. It logically follows then that the most important and effective portion of the management of the menopause is explanation, reassurance, and simple psychotherapy. In the majority of patients such an approach provides notable relief of anxiety.

It is appropriate to emphasize the tragedy which may result if either the patient or her physician casually attributes, without proper investigation, any or all symptoms arising at midlife to the menopause. Symptoms which would have stimulated attention prior to the menopause are all too frequently consigned to the "menopausal syndrome" when they first occur in midlife. Numerous clinical disorders occur at the same time as the menopause and a casual relationship between some of these disorders and the menopause has therefore been inferred.

There is no evidence for the existence of a form of hypertension related to the menopause. Arthralgias associated with the menopause are quite common and are often relieved by treatment with estrogens, but there is no evidence of a specific "menopausal arthritis." A peculiar form of muscular dystrophy occurring at the time of the menopause, consisting of progressive muscular weakness of the hip and shoulder girdle, has been called "menopausal muscular dystrophy," but it has not been shown to be due to estrogen deficiency and cases have also been reported in males.[5] Migraine is said to decrease in severity and frequency at the time of the menopause, but this is not an invariable rule. Diabetes occurring before and after the menopause has been found to be ameliorated by estrogen therapy in some instances. Atrophic changes in the urethra may produce urinary frequency and dysuria and a cystocele or retrocele may become symptomatic.

Menopausal Therapy

One of the more common problems of the menopausal patient is abnormal uterine bleeding which is related to failure of ovulation and decreasing production of estrogen. Almost any variant of abnormal bleeding may occur, presumably due to fluctuating titers of estrogen. For the patient with one episode of abnormal bleeding—prolongation of a period, an excessively heavy period, or an episode of spotting—it is probably reasonable to wait for the next cycle if complete examination and cytological smears of the cervix and vagina are normal. A second abnormal episode is an indication for curettage. An attempt at hormonal control prior to the exclusion of malignant disease as a cause of the bleeding is obviously inappropriate. Previous injudicious administration of estrogens frequently makes the evaluation of menopausal bleeding unnecessarily difficult.

In many instances curettage in patients with dysfunctional uterine bleeding during the premenopause is not only diagnostic but therapeutic. In others, hormonal control of hypermenorrhea is usually possible by the cyclic use of a progestational agent. If bleeding is poorly controlled by progesterone, the administration of an estrogen such as diethylstilbestrol in doses of at least 6 mg. a day for 26 days with a progestogen given for the last 5 days of the 26-day period usually permits a controlled withdrawal bleeding. Hysterectomy is justified for the control of bleeding only rarely.

Although in some women hot flashes are partially or completely relieved by reassurance or sedatives, the accepted treatment is the proper administration of an estrogen. Although estrogens are available in injectable form or may be implanted as pellets, the experience in this clinic has indicated that administration of small doses of an oral preparation is entirely satisfactory in the great majority of patients. Estrogens should be given according to a definite schedule with periodic interruptions, so that if withdrawal bleeding does occur, it may reasonably be attributed to the administration of estrogens and not to an unrecognized uterine carcinoma. It is our custom to give estrogens for 30 days, to discontinue them for 7 days, and then to resume treatment.

Some physicians favor the use of androgens in combination with estrogens, the 2 classes of drugs appearing to have a synergistic effect. The use of androgens permits a smaller dose of estrogen and therefore diminishes the frequency of estrogen-induced bleeding. The usual dose of methyltestosterone is 2.5 to 10 mg. sublingually. Androgens appear to increase the general sense of well-being, an effect not as noticeable with the use of estrogens alone. Combined therapy appears to be indicated in women with severe osteoporosis and in those with chronic cystic mastitis. However, the masculinizing effects of androgens frequently limit the dose that can be given and the duration of treatment. Kupperman, Wetchler, and Blatt[6] have recently reviewed the problem of hormone therapy.

The majority of women who need hormone therapy during the menopause usually require it for only 1 or 2 years. Students of the menopause differ in their recommendations for the management of the menopause only in the degree of emphasis that is placed on the psychological versus the hormonal components. Estrogens are widely used, and no fear is expressed as to their possible carcinogenicity if they are used on a short-term basis. The long-term use of estrogens, however, is a more controversial issue.

Postmenopausal Treatment

The management of the postmenopausal years rather than the 1 or 2 years of hormonal and psychological adjustment attendant upon the cessation of menstruation has become the major problem. A rapid increase in life expectancy of women during the last 50 years indicates that the average woman can now expect to live at least 24 years after the menopause. A considerable amount of evidence suggests that some forms of osteoporosis, dermal atrophy, atrophic changes in the genital tract, and atherosclerotic disease are related to the estrogen-deficient state, and it is, therefore, logical to inquire as to whether these processes can be delayed or perhaps even prevented by estrogens.

The postmenopausal woman continues to secrete estrogen, the major source of which is the ovary. There is also evidence that the adrenal glands are a source of estrogen. Estrogen excretion after the menopause remains at fairly constant levels, but there is considerable variation from one individual to another. Menopausal symptoms do not correlate with the amount of estrogen excreted. It has not been established whether the individual with the lower estrogen excretion is more prone to osteoporosis or atherosclerosis.

That prolonged estrogen therapy is effective in alleviating the postmenopausal changes of senile vaginitis is well established. Similarly, atrophic changes in the urinary tract may be reversed by estrogens. Estrogens have beneficial effects on the skin and there is some evidence that they improve intellectual function.

Postmenopausal osteoporosis, as defined by Wallach and

Henneman,[7] is a "generalized loss of bone mass affecting the spine most severely, which occurs in a small percentage of women after the menopause." It has been generally believed that postmenopausal osteoporosis is related to estrogen deficiency and decreased osteoblastic activity. It has also been held that the decrease in bone mass is the net effect of persistent secretion of adrenal hormones in the absence or diminished secretion of the gonadal hormones. However, Nordin[8] has more recently suggested that osteoporosis must result from negative calcium balance and that either low intake of calcium, malabsorption, or hypercalciuria is the more important cause of osteoporosis.

Although the causes of osteoporosis remain unsettled, the clinical effect of estrogens appears well established. Pain is effectively relieved, further fractures are usually prevented, and loss of height ceases in most instances. In Wallach and Henneman's patients, osteoporosis did not develop in women in whom estrogen therapy was employed; this suggests that estrogens are an effective prophylaxis against postmenopausal osteoporosis.

There is an increasing amount of evidence to implicate decrease of ovarian estrogen production with the sharp rise in incidence of coronary atherosclerosis in women in the sixth decade of life. Wuest, Dry, and Edwards[9] found the degree of atherosclerosis in women who had been subjected to bilateral oophorectomy was greater than that in non-oophorectomized women. The studies of Rivin and Dimitroff[10] suggest a decreased incidence of atherosclerosis in women receiving estrogens or those in hyperestrogenic states. Castration before the natural menopause results in an increase of atherosclerosis as clinically manifested by coronary heart disease and peripheral vascular disease.[11] Decreased urinary excretion of estrogen has been found in women with myocardial infarction.

Alterations of serum cholesterol, cholesterol-phospholipid ratios, and of beta/alpha lipoprotein cholesterol ratios are frequently associated with coronary atherosclerosis. Estrogens have been shown to be capable of reverting abnormal serum lipids towards normal. These observations suggest a possible beneficial effect of estrogens in the treatment of atherosclerosis in postmenopausal women.

Concern over the possible carcinogenicity of estrogens does not seem justified on the basis of the available evidence. There is no direct proof that estrogens as used therapeutically in the human female are carcinogens and the circumstantial evidence has been seriously challenged.[12]

In view of preliminary observations that indicate a considerable variation in the degree of estrogen deficiency in postmenopausal women, it is conceivable that, with further refinement in estrogen assays, it will be possible to select those women in whom estrogen replacement is clearly desirable. Certainly those with premature menopause, either natural or artificially induced, should receive estrogens.

Since numerous preparations are available, it is desirable for the physician to select 1 or 2 preparations and familiarize himself with their use. In our experience, diethylstilbestrol given orally in doses of 0.5 to 1 mg. daily for 30 days, interrupted for 7 days, and then resumed, has been entirely satisfactory. Nausea, reported to occur in some 20% of the patients receiving diethylstilbestrol, has not been a serious problem and frequently disappears in a few days even when use of the drug is continued. Conjugated estrogenic substances (Amnestrogen, Conestron, Estrifol, Premarin), in doses of 1.25 mg., are used in those patients unable to take diethylstilbestrol. The importance of intermittent therapy is again stressed. No genital carcinomas arose in Wallach and Henneman's group of patients in whom cyclic therapy was used. Continuous estrogen administration almost invariably results in irregular bleeding. Intermittent therapy, when it leads to menstruation, produces regular withdrawal bleeding which can logically be attributed to the administered estrogen without concern that one is dealing with an unrecognized carcinoma.

For the control of the depressive menopausal symptoms, 5 mg. of dextro amphetamine sulfate (d-Amfetasul, Dexedrine Sulfate, Dextro Amphetamine Sulfate) at 8 a.m. and 12 noon and 60 mg. of sodium amytal at 8 a.m., 12 noon, and 4 p.m. should be given.

We have been unable to see the advantages of the numerous preparations containing a combination of estrogens and tranquilizers. We believe that their use complicates rather than simplifies management of the menopause.

Summary

The management of the menopause is not complex but requires careful consideration to exclude contemporary signs or symptoms that are not due to the cessation of menstruation. The importance of simple psychotherapy along with proper administration of estrogens to alleviate hot flashes is stressed. Increasing evidence suggests that prolonged cyclic estrogen therapy is indicated in at least some postmenopausal women in the hope of delaying or preventing atherosclerosis and osteoporosis. The hazards of prolonged use of estrogens appear to be minimal.

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POSITIONS

in hospital pharmacy

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A listing of positions open and wanted will be made regularly in the AMERICAN JOURNAL OF HOSPITAL PHARMACY without charge. Neither the name of the hospital offering the position nor the name of the applicant will be listed, except by code. All inquiries should be directed as shown below, including the code number.

Address all inquiries to

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positions open

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STAFF PHARMACIST—354 bed general hospital. Must be registered or eligible for registration in Indiana. Forty hour week, liberal benefits. PO-273

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ASST. CHIEF PHARMACIST—130 bed general hospital located in Louisiana. Duties include compounding and dispensing drugs and related items, furnishing information to nurses and doctors, maintaining records, and assisting in purchasing and general management of the dept. Forty hour week, vacation, hospitalization and sick leave. PO-270

ASST. CHIEF PHARMACIST—230 bed general hospital located in Connecticut. Assist in the operation of the pharmacy dept. and assume responsibility in absence of chief pharmacist. Male or female. Forty hour week, liberal benefits. PO-269

STAFF PHARMACIST—365 bed modern general hospital located in Texas. Prefer recent graduate with B. S. in pharmacy. Male or female. Forty hour week. Liberal personnel policy. PO-267

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CHIEF PHARMACIST—450 bed hospital in New Jersey. Duties include compounding and dispensing medicines and preparations, preparing and sterilizing injectible medications manufactured in hospital and other related duties. Male or female. Forty hour week, liberal personnel policies. PO-259

STAFF PHARMACIST—700 bed University teaching hospital. Duties include inpatient and outpatient dispensing. B. S. required. Must be registered or eligible for registration in Wisconsin. Forty hour week, vacation and insurance program. PO-255

ASST. CHIEF PHARMACIST—317 bed general hospital located in Delaware. Duties include assisting chief pharmacist in carrying out procedures and policies. Male preferred with internship, preferably M. S. Degree. Forty hour week, vacation and liberal personnel policies. PO-254

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STAFF PHARMACIST—525 bed general hospital located in Ohio. Duties include filling prescriptions for patients, floor stock and clinic patients. Must be registered in Ohio. Forty hour week, vacation and personnel policies. PO-249

CHIEF PHARMACIST—60 bed general short-term hospital. Pharmacist will be completely responsible for the operation of the pharmacy dept., including purchasing drugs and supplies and the preparation of monthly reports. Will also be responsible for meeting with the pharmacy and therapeutics committee making suggestions and recommendations for pharmacy procedures. Must be registered in California. Liberal personnel policy. PO-248

STAFF PHARMACIST—240 bed general hospital expanding to 300 beds. Male or female. Must be registered in Tennessee. Forty hour week, vacation and liberal benefits. PO-247

STAFF PHARMACIST—700 bed general hospital. Duties include dispensing drugs from the central and clinic pharmacies. Registration in Georgia required. Male or female. Liberal personnel policies. PO-245

STAFF PHARMACIST—275 bed private hospital in Chicago. Applicant will compound and dispense drugs and medicines. Must be licensed in Illinois. Forty hour week, vacation and other liberal benefits. PO-243

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ASST. CHIEF PHARMACIST—650 bed general hospital located in Nebraska. Duties include refilling patient orders, floor supplies for nursing stations and compounding supplies. Forty hour week, vacation. PO-236

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CHIEF PHARMACIST—120 bed general hospital located in Kansas. Pharmacist will organize pharmacy department and assist in teaching pharmacology to student nurses. Must be registered or eligible for licensure. Forty-four hour week, vacation and other liberal benefits. PO-230

STAFF PHARMACIST—550 bed teaching hospital located in Virginia. No experience necessary. Female preferred. Forty hour week, vacation and liberal benefits. PO-226

CHIEF PHARMACIST—general hospital located in West Virginia. Pharmacist will be under direct supervision of the administrator, filling prescriptions and allied duties; planning; organizing; and directing pharmacy and central sterile supply in accordance with established policies. B. S. required. Forty hour week, liberal benefits. PO-225

CHIEF PHARMACIST—100 bed general hospital located in Ohio. Applicant must have organizational ability and will assume administrative responsibilities of the dept. Must be registered. PO-224

CHIEF PHARMACIST—Psychiatric hospital located in Ohio. Must be registered in Ohio. Forty hour week, vacation and retirement benefits. PO-221

ASST. CHIEF PHARMACIST—238 bed general hospital located in Michigan. Duties include dispensing, controlling pharmacy divisions on nursing units, and assuming responsibility of the pharmacy in absence of chief pharmacist. Forty hour week, vacation, holidays and sick leave. PO-204

ASST. CHIEF PHARMACIST—204 bed hospital. Duties include dispensing, receiving and labeling drugs, etc., furnishing information to physicians and nurses; teaching student nurses; and being responsible as an assistant department head in administrative and other related duties. Forty hour week, vacation, insurance and sick leave. Must be eligible for registration in Illinois. PO-203

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CHIEF PHARMACIST—2300 bed mental hospital. Pharmacist will have complete charge of pharmacy, drug orders, stocking, dispensing, compounding necessary records and other pharmacy duties. Must be licensed in Ohio. Forty hour week, vacation, holidays, insurance, retirement plan and sick leave benefits. PO-189

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CHIEF PHARMACIST—264 bed general hospital located in Texas. Plans and directs pharmacy policies, compounds and dispenses medicines, purchases supplies and materials, maintains records, and prepares periodical reports. Must be eligible for or have M. S. Degree. Forty hour week, vacation, retirement, sick leave and insurance plan. PO-177

STAFF PHARMACIST—200 bed general hospital. Duties include compounding, dispensing and manufacturing. Applicant must have B. S. in Pharmacy and be registered in Connecticut. Recent graduate acceptable. Forty-four hour week, vacation, pension plan and hospitalization. PO-168

STAFF PHARMACIST—100 bed general hospital located in Texas. Assume personal responsibility for accurate filling of prescriptions and supplies, assist in inspecting drugs in nursing stations, replace stock taken from night emergency container, inspect and refill opthalmic solution trays from operating room, emergency room, and central supply. Female preferred. Must be registered or eligible for registration in Texas. Forty hour week, vacation, holidays and sick leave. PO-164

ASST. CHIEF PHARMACIST—280 bed general hospital. Duties include filling prescriptions and medication orders from various units, supervise pharmacy clerks, assume administrative responsibility when chief pharmacist is absent. Forty-four hour week, sick leave and holidays. Must be registered in Illinois. PO-161

STAFF OR ASST. CHIEF PHARMACIST—150 bed general hospital located in New Mexico. Generous benefits. PO-134

STAFF PHARMACIST—500 bed general hospital located in Oklahoma. B. S. required. Forty hour week. PO-95

ASST. CHIEF PHARMACIST—237 bed general hospital in West Virginia. Female desired. Forty-four hour week, vacation. PO-77

positions wanted

STAFF OR ASST. CHIEF PHARMACIST—Male, married. One year's hospital pharmacy experience. Prefers to locate in Florida. Registered in Michigan. PW-330

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. Ph. G. Hospital pharmacy experience. Prefers to locate in Maryland. Registered in Maryland. PW-329

ASST. CHIEF OR CHIEF PHARMACIST—Female, single. Obtained B. S. in 1960. Serving hospital pharmacy internship. Prefers to locate in Michigan. Registered in Michigan. PW-328

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. Obtained M. S. in 1961. Two years' hospital pharmacy experience. Prefers to locate in Minnesota. Registered in Minnesota and California. PW-327

CHIEF PHARMACIST—Male, married. B. S. Hospital Pharmacy experience. Will locate anywhere. Registered in New Jersey and Pennsylvania. PW-326

STAFF OR ASST. CHIEF PHARMACIST—Female, single. Will obtain B. S. in June 1961. Hospital pharmacy experience. Prefers to locate in the Midwest, West or Northeast. PW-325

STAFF OR ASST. CHIEF PHARMACIST—Female, single. Obtained B. S. in 1960. Hospital pharmacy experience. Will locate anywhere. Registered in Michigan. PW-324

ASST. CHIEF OR CHIEF PHARMACIST—Male, single. Obtained B. S. and M. S. in 1956. Three years' hospital pharmacy experience, and two years teaching experience. Served hospital pharmacy internship. Prefers to locate in the South or Southwest. Registered in Georgia and Tennessee. PW-323

ASST. CHIEF OR CHIEF PHARMACIST—Male, single. Obtained M. S. in 1960. Four years' hospital pharmacy experience. Prefers to locate in California or Missouri. Registered in California and Missouri. PW-322

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. Obtained B. S. in 1960. Hospital pharmacy experience. Military obligations completed. Will locate anywhere. Registered in Pennsylvania. PW-321

CHIEF PHARMACIST—Female, single. Obtained B. S. in 1956. Five years' hospital pharmacy experience. Prefers to locate in the East. Registered in Florida and Georgia. PW-320

ASSOC. DIRECTOR OR DIRECTOR OF PHARMACY SERVICE—Male, married. Obtained M. S. in 1960 at University of Michigan. Teaching and hospital pharmacy experience. Served hospital pharmacy internship. Will locate anywhere. Registered in Pennsylvania. PW-319

STAFF OR ASST. CHIEF PHARMACIST—Male, single. Obtained B. S. in 1955. Hospital pharmacy experience. Prefers to locate in the East. Registered in New York, Maine and Indiana. PW-318

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. Obtained B. S. in 1960. Prefers to locate in the Southeast. Registered in Tennessee. PW-317

STAFF OR ASST. CHIEF PHARMACIST—Female, single. Will obtain B. S. in June 1961 at Purdue University. Has worked part-time as an apprentice in hospitals. Will locate anywhere. PW-316

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. Obtained B. S. and presently working for M. S. at University of Maryland. Hospital pharmacy experience. Prefers to locate in the East. Registered in Maryland. PW-315

CHIEF PHARMACIST—Male, single. Obtained B. S. in 1955. Serving hospital pharmacy internship. Hospital pharmacy experience. Registered in Texas. Will locate anywhere. PW-314

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. Obtained B. S. in 1954 at University of Cincinnati College of Pharmacy. Three years' hospital pharmacy experience. Prefers to locate in Texas or Hawaii. Registered in Ohio. PW-313

ASST. CHIEF OR CHIEF PHARMACIST—Male, single. Obtained B. S. in 1960 at Oklahoma University. Two years' hospital pharmacy experience. Prefers to locate in the Southwest. Registered in Oklahoma. PW-312

ASST. CHIEF OR CHIEF PHARMACIST—Male, single. Obtained B. S. in 1959 and will obtain M. S. in August at State University of Iowa. Two years' hospital pharmacy experience. Serving hospital pharmacy internship. Prefers to locate in Midwest or West. Registered in Iowa. PW-311

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. Obtained B. S. in 1958 at Rutgers University College of Pharmacy. Three years' hospital pharmacy experience. Prefers to locate in the Mideast. Registered in New Jersey. PW-310

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. M.S. expected in June 1961. Served hospital pharmacy internship. Two years' hospital pharmacy experience. Prefers to locate in Midwest or East. Registered in Iowa but willing to reciprocate. PW-309

STAFF OR ASST. CHIEF PHARMACIST—Female, single. Obtained B. S. in 1959 at Texas Southern University. Hospital pharmacy experience. Served hospital pharmacy internship. Prefers to locate in the West. Registered in Texas. PW-308

STAFF PHARMACIST—Male, married. Obtained B. S. in 1940 at Brooklyn College of Pharmacy. Will locate anywhere. Registered in New York, Pennsylvania, New Jersey and Florida. PW-307

STAFF PHARMACIST—Male, single. B. S. obtained in 1960 at Texas Southern University. Will locate anywhere. Registered in Louisiana and in the process of being registered in Oklahoma. PW-306

CHIEF PHARMACIST—Male, married. B.S. obtained in 1957 at University of Cincinnati. Four years' hospital pharmacy experience. Prefers to locate in the Midwest. Registered in Kentucky and will soon be registered in Colorado. PW-304

CHIEF PHARMACIST—Male, married. Will obtain M. S. in June of 1961. Serving hospital pharmacy internship. Hospital pharmacy experience. Will locate anywhere. PW-303

STAFF PHARMACIST—Male, married. Obtained B. S. in 1960. Hospital pharmacy experience. Prefers to locate in the West. Registered in Texas. PW-302

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. Obtained B. S. in Organic Chemistry in 1941 and B. S. in Pharmacy in 1953. Five years' hospital pharmacy experience. Prefers to locate in Michigan or Colorado. Registered in Michigan. PW-301

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. Obtained B. S. in 1959. Will obtain M. S. in 1961 at University of Florida. Two years' hospital pharmacy experience. Serving hospital pharmacy internship. Prefers to locate in the West, North or East. Registered in Florida. PW-299

STAFF PHARMACIST—Male, married. B. S. obtained at Texas Southern University, Houston in 1960. Will locate anywhere. Registered in Texas. PW-298

ASST. CHIEF OR CHIEF PHARMACIST—Female, single. B. S. obtained at Ohio State University College of Pharmacy in 1954. Five years' hospital pharmacy experience. Prefers to locate in the Midwest or East. Registered in Illinois and Ohio. PW-297

STAFF OR ASST. CHIEF PHARMACIST—Male, married. B. S. obtained in 1952 at Idaho State College. Prefers to locate in California. Registered in Idaho, Utah, Washington, Oregon and California. PW-296

STAFF PHARMACIST—Female, single. B. S. obtained in 1956 at Philadelphia College of Pharmacy and Science. Hospital pharmacy experience. Prefers to locate in the Los Angeles, California area. Registered in Pennsylvania and eligible for registration in California. PW-295

CHIEF PHARMACIST—Male, married. B. S. obtained at the Philadelphia College of Pharmacy and Science in 1951. Nine years' hospital pharmacy experience. Prefers to locate in the North, Midwest or in the West. Registered in Pennsylvania and Delaware. PW-294

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. Obtained M. S. at Philadelphia College of Pharmacy. Served hospital pharmacy internship. Three years' hospital pharmacy experience. Prefers to locate in Connecticut. Registered in Connecticut and Pennsylvania. PW-290

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. Obtained M.S. at the University of Iowa in 1958. Served hospital pharmacy internship. Military obligations completed. Hospital pharmacy experience. Prefers to locate in the West. Registered in Colorado and Iowa. PW-289

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. B. S. obtained at University of Illinois. Extensive hospital pharmacy experience. Prefers to locate in the East or Midwest. Registered in Illinois. PW-287

STAFF OR ASST. CHIEF PHARMACIST—Male, married. Obtained B. S. in 1954 at Rutgers College of Pharmacy. Hospital pharmacy experience. Prefers to locate in Florida. Registered in Florida, New Jersey and New York. PW-286

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. B. S. received at Purdue University in 1944. Served hospital pharmacy internship. Extensive hospital pharmacy experience. Will locate anywhere. Registered in Indiana, Michigan and Wisconsin. PW-285

STAFF OR ASST. CHIEF PHARMACIST—Male, single. Obtained B. S. in 1959 at the University of Colorado. Completed hospital pharmacy internship at Denver General Hospital in June 1960. Prefers to locate in the West or Midwest. Registered in Colorado. PW-284

ASST. CHIEF OR CHIEF PHARMACIST—Female, married. B. S. obtained in 1954. Six years' hospital pharmacy experience. Prefers to locate in New York, New Mexico, Texas and Louisiana. PW-282

CHIEF PHARMACIST—Male, married. Obtained B. S. in 1953 at St. John's College of Pharmacy. Seven years' hospital pharmacy experience. Prefers to locate in the northeast. Registered in New York and New Jersey. PW-279

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. Received at Ohio State University B. S. in Biology in 1952 and B. S. in Pharmacy in 1955. Five years' hospital pharmacy experience. Willing to locate in the East, North or West. Registered in Ohio. PW-277

ASST. CHIEF OR CHIEF PHARMACIST—Female, single. B. S. obtained in 1956 at University of Wyoming. Working towards M. S. at the University of Maryland. Served hospital pharmacy internship. Hospital pharmacy experience. Prefers to locate in the West. Registered in Wyoming. PW-276

STAFF OR ASST. CHIEF PHARMACIST—Female, married. B. S. obtained in 1954 at St. Louis College of Pharmacy. Six year's hospital pharmacy experience. Prefers the Northwestern part of the country, but willing to locate anywhere. Registered in Missouri. PW-275

ASST. CHIEF OR CHIEF PHARMACIST—Male, single. M. S. obtained in 1958 at University of Texas. Served hospital pharmacy internship. Hospital pharmacy experience. Prefers to locate in the Southwest. Registered in Kansas and Texas. PW-270

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. B. S. obtained in 1955 at the University of Nebraska. Five years' hospital pharmacy experience. Prefers to locate in California. Registered in Nebraska and California. PW-269

ASST. CHIEF OR CHIEF PHARMACIST—Female, single. B. S. Degree. Fifteen years' administrative and practical experience in hospital pharmacy. Prefers Midwest, particularly Illinois or Wisconsin. Registered in Virginia, Illinois, Wisconsin and Michigan. PW-268

CHIEF PHARMACIST—Male, single. Obtained M. S. in 1954 at University of Tennessee. Served hospital pharmacy internship. Six years' hospital pharmacy experience. Prefers to locate in the Southwest or in Florida. Registered in Connecticut and New York. PW-266

CHIEF PHARMACIST—Male, married. M. S. obtained in 1957 at Nebraska University College of Pharmacy. Served hospital pharmacy internship. Six years' hospital pharmacy experience. Prefers to locate in the West or Midwest. Registered in Colorado, Missouri and Nebraska. PW-265

CHIEF PHARMACIST—Male, married. Obtained M. S. in hospital pharmacy at State University of Iowa in June 1959. Served hospital pharmacy internship. Three years' hospital pharmacy experience. Will locate anywhere. Registered in Illinois. PW-264

CHIEF PHARMACIST—Male, married. B. S. Served hospital pharmacy internship. Extensive hospital pharmacy experience. Prefers to locate in the Midwest. Registered in Ohio. PW-263

CHIEF PHARMACIST—Male, married. B. S. Fourteen years' hospital pharmacy experience. Prefers to locate in the East or Midwest. Registered in Pennsylvania and West Virginia. PW-260

ASST. CHIEF PHARMACIST—Male, single. Obtained B. S. in 1956 at Purdue University. Hospital pharmacy experience. Prefers position with administrative and/or teaching duties. Would like to locate in Northeast or Southwest section of country. Registered in Texas. PW-256

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. Obtained B. S. in 1954 at South Dakota State College. Two years' hospital pharmacy experience. Will locate anywhere. Registered in South Dakota. PW-247

STAFF PHARMACIST—Male, married. Received B. S. in June 1960 at Philadelphia College of Pharmacy and Science. One year's hospital pharmacy experience. Prefers to locate in Philadelphia. PW-246

DIRECTOR OF PHARMACY SERVICES—Male, single. Received B. S. in 1956 at the University of California. Served hospital pharmacy internship. Four years' hospital pharmacy experience. Registered in California. Prefers to locate in California. PW-237

PHARMACIST—Female, single. M. S. received at University of Maryland in 1951. Served hospital pharmacy internship. Five years' hospital pharmacy experience. Prefers to locate in New Jersey. Registered in Pennsylvania and Missouri. PW-225

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. B. S. received at Detroit Institute of Technology in 1950. Four years' hospital pharmacy experience. Prefers to locate in Michigan. Registered in Michigan. PW-224

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. Received B. S. at Medical College of South Carolina in 1950. Four years' hospital pharmacy experience. Prefers Southeast section of country. Registered in North Carolina and South Carolina. PW-221

STAFF OR CHIEF PHARMACIST—Male, single. B. S. received in 1952 at St. Louis College of Pharmacy. Two years' hospital pharmacy experience. Registered in Missouri. Prefers to locate on the West Coast. Particularly California. PW-217

STAFF PHARMACIST—Female, single. B. S. Seven years' hospital pharmacy experience. Southwest section of country preferred. Registered in Alabama and Georgia. PW-199

ASST. CHIEF OR CHIEF PHARMACIST—Male, married. M. S. obtained in 1956 at Columbia University College of Pharmacy. Hospital experience. Prefers to locate in California. Registered in New York, Michigan, New Jersey and Florida. PW-184

ASST. CHIEF OR CHIEF PHARMACIST—Male. B. S. received in 1954. Desires to locate in Michigan, Ohio and Illinois. Registered in Michigan. PW-177

CHIEF PHARMACIST—Male, married. B. S. Ten years' hospital pharmacy experience. Registered in Mass., Ill., Mo., Ky., Tenn., and Virginia. PW-150

ASST. CHIEF OR CHIEF PHARMACIST—Male, single. Registered in D. C., Ill., Md., and Penna. Graduate University of Pittsburgh in 1953. Experience in research. Prefers North and East. PW-148

CHIEF PHARMACIST—Male, married. Graduate of St. Johns University College of Pharmacy. Extensive experience as chief pharmacist and purchasing agent. Prefers to locate in New York or New Jersey. Registered in New York and New Jersey. PW-144

CHIEF PHARMACIST—Female, single. Registered in Pennsylvania and Ohio. Twelve years' hospital pharmacy experience as a chief pharmacist. Prefers to locate in Penna., and Ohio. PW-111

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